KUVEMPU UNIVERSITY

Revised syllabus

BCA, B. Sc (Computer Science) and BA (Computer Applications)

W.E.F 2019-20

DEPARTMENT OF P.G. STUDIES AND RESEARCH IN COMPUTER SCIENCE,

JANNASHAYADRI , SHAKARGHATTA

SHIMOGA, KARNATAKA

NEW SYLLABUS FOR B.Sc. (Computer Science)

(EFFECT FROM 2019-20)

Paper code	Semester	SUBJECT	Weekly hours	Internal marks	External marks	Practicals	Total
BSC1	I	CF &CP	4+3	10	50	40	100
BSC1	I	CF &CP	4+3	10	50	40	100
BSC2	II	DS	4+3	10	50	40	100
BSC3	III	DBMS	4+3	10	50	40	100
BSC4	IV	C++	4+3	10	50	40	100
		JAVA	4+3	10	50	40	100
BSC5	V	UNIX Programming	4+3	10	50	40	100
		Advanced JAVA	4+3	10	50	40	100
BSC6	VI	SE&CN	4+3	10	50	40	100

FIRST SEMESTER B.Sc (Computer science)

Computer Science -I

BSC-1 Computers Fundamentals and C Programming

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to Computer Systems: **10 hrs**

Definition of a Computer, History of Computers, Generations of Computers, types of computer – based on size and working principle, Block diagram of a Computer with functional units(explanation), Parts of a computer system, Information processing Cycle. Definition of software and hardware, types of programming languages, assembler, compiler, interpreter, linker, loader (Definitions only),number system – decimal, binary, octal and hexadecimal number, inter-conversion of decimal to binary and vice-versa. ASCII codes.Algorithm-definition, Characteristics, notations. Flowchart-definition, Symbols used in writing the flow-chart Writing an algorithm and flow-chart of simple problems.

Unit 2- Introduction to Computer Systems: **10 hrs**

Introduction to C, features ofC , basic C program structure, character set, tokens, keywords and identifiers. Constants, variables, data types, variable declaration, symbolic constant definition.

Unit 3- Operators and Expressions: **08 hrs**

C operators- arithmetic, relational, logical, bitwise, assignment, increment and decrement, conditional (?:) and special operators, Arithmetic expressions, precedence of operators and associatively. Type conversions, mathematical functions.Definition of macro and pre-processor directives, Managing I/O operation – reading and writing a character, formatted and unformatted/O functions.

Unit 4- Control Structures: **10 hrs**

Conditional control statements- if, if-else,nested-if,switch , go to statement, while, do-while and for statements. Unconditional control statements- break, continue and return statements(definition and explanation with syntax, flowchart and examples)

Unit 5- Arrays, Strings and Functions: **10 hrs**

Definitions of an array, types-one and two dimensional array,(definition, declaration, initialization with examples).Strings–definition, declaration and initialization of string variable, string handling functions- strcmp,strcpy, strrev, strlen, strlwr, strupr(explanation with syntax and examples) Functions – definition, need, syntax for function declaration, function prototype, category of functions, nesting offunctions, function with arrays, scope of variables ,parameter passing mechanism-call by value and call by reference. Recursion and Recursive function(definitions only)

Reference :

1. Fundamentals of Computers, V. Rajaraman.

2. Computer Concepts and C Programming, P.B. Kotur

3. Let us C ,YashwanthKanetkar

4. ANSI C, Balagurusamy

QUESTION PAPER PATTERN FOR I SEMESTER B.Sc(Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: C- PROGRAMMING LAB

1. Find the biggest of three numbers.
2. Arithmetic operations using switch statement.
3. Find the Fibonacci series between M and N.
4. Prime numbers between M and N
5. Binary to Decimal conversion
6. Sorting an unsorted array
7. Searching an element in an array.
8. Addition of two matrices
9. Multiplication of two matrices
10. Norm and trace of the matrix.
11. Count the numbers of vowels in a given string.
12. Find the factorial of a number using function.

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Flowchart/Algorithm 05 Marks
- ✓ Program Writing 15 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SECOND SEMESTER B.Sc (Computer science)

Computer Science -II

BSC-2 DATA STRUCUTRES USING C

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to Data Structure: **10 hrs**

Definition of Structure, syntax and example for structure declaration.Definition of union, syntax and example for union declaration, difference between structure and union.Pointers–Definition, Declaration, Examples. Dynamic memory allocation functions – syntax and examples. Definition of Data Structure and types of data structures with examples.

Unit 2 – Stack and recursion: **10 hrs**

Definition and example of stack (LIFO), operations of stack with algorithms, applications of stack, algorithm for the conversion of infix to postfix expression. evaluation of postfix expression , Tower of Hanoi problem and factorial of a number using recursion.

Unit 3- Queue: **10 hrs**

Definition and example of Queue (FIFO), operations on queue, types of queue – ordinary queue and circular queue (definitions only), disadvantages of ordinary queue. Linked list–Definitions and types of lists (definitions only), operations of Single Linked List, implementation of stack using linked list, implementation of queue using linked list,

Unit 4- Tree : **10 hrs**

Definition of a Tree, Definition of root, left sub tree, right sub tree, degree of node, terminal node, depth, Definition of Binary tree, types of binary trees (definition only), Algorithm for tree traversal.

Unit 5- Sorting and searching: **08 hrs**

Definition of sorting, explanation of bubble sort, shell sort, radix sort and merge sort with examples. Definition of searching, explanation of Binary search and linear search with examples and algorithms.

References:

1. Systematic approach to data structure - Padmareddy
2. Programming in ANSI C - E Balaguruswamy
3. Datastructures and applications - Trembly and Sorenson

QUESTION PAPER PATTERN FOR II SEMESTER B.Sc(Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: DATA STRUCUTRES LAB

1. Implementation of stack
2. Evaluation of postfix expression
3. Conversion of infix to postfix
4. Tower of Hanoi
5. Implementation of queue
6. Implementation of stack using linked list
7. Implementation of queue using linked list
8. Quick sort
9. Shell sort
10. Binary search

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
  - ✓ Program Flowchart/Algorithm 05 Marks
  - ✓ Program Writing 15 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

THIRD SEMESTER BSc (Computer science)

Computer Science -III

BSC-3OBJECT ORIENTED PROGRAMMING WITH C++

Theory Examination- 50 Max marks. Number of Teaching hours –48

Internal Assessment- 10 Max marks

Unit 1- Introduction to OOPS: 10 hrs

Object Oriented Programming paradigm, Basic concepts of Object Oriented Programming-Classes, Objects, Data Abstraction and Encapsulation, Polymorphism, Inheritance, Dynamic Binding, Message passing, Benefits of OOP, applications of OOP.

Unit 2-Introduction to C++: 10 hrs

Difference between C and C++, Structure of a C++ program, input and output statements, tokens - Keywords, identifiers, constants, strings and operators, reference variables – definition and example, special operators in C++, brief introduction to control structures in C++.

Unit 3-Classes Objects and Member Functions: 10 hrs

Difference between structure and class, syntax and example for class declaration, Definition of data member and member function, Defining member function inside and outside the class, inline functions, array of objects, default arguments, static data members and static member functions, function overloading, definition of friend function, syntax and example for the declaration of friend function, special characteristics of friend function.

Unit 4- Constructors, destructorsand Operator overloading: 09 hrs

Definition of a constructor, types - parameterized constructor, default constructor, copy constructor, special characteristics of constructor, definition of a destructor, special characteristics of destructor, definition to Operator overloading, overloading binary operator (+) to add two complex numbers, rules for operator overloading.

Unit 5: Inheritance and templates: 09 hrs

Definition of Inheritance,forms of inheritance, syntax and example for defining derived classes, visibility modes, explanation of multilevel inheritance and hybrid inheritance with examples. Definition of templates, syntax and example for class and function template.

Reference Books:

1. Object Oriented Programming with C++ - E Balaguruswamy
2. C++ - The Complete Language – BjarneSchildt
3. Object Oriented Programming in Turbo C++ - Robert Lafore

QUESTION PAPER PATTERN FOR III SEMESTER B.Sc (Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: C++ LAB

1. Write a c++ program to find the result of a student using class concept
2. Define a class to represent product details it includes data member pname, pcode, price, pquality include member function a) to get product detail b) to display the product details and total price using class concept
3. Write a c++ program to print Fibonacci series using constructor
4. Write a c++ program to find biggest of two numbers and three numbers using function overloading
5. write a c++ program to calculate area of triangle, rectangle and circle using function overloading
6. write a c++ program to calculate family income using friend function
7. write a c++ program to add two complex numbers using operator overloading
8. write a c++ program to implement multiple inheritance by creating classes: father , mother and son
9. write a c++ program to swap two numbers using function template
10. write a c++ program to sort an array using function template

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
  - ✓ Program Flowchart/Algorithm 05 Marks
  - ✓ Program Writing 15 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

FOURTH SEMESTER B.Sc (Computer science)

Computer Science -IV

BSC-4 DATABASE MANAGEMENT SYSTEM

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to DBMS: **10 hrs**

Meaning of data and information, definitions of database, applications of database system, definition of DBMS, disadvantages of file processing system (advantages of DBMS), three levels of data abstraction, difference between schema and instance, definition of data models, types of data models (brief explanation), database languages – DDL and DML.

Unit 2- E-R model: **10 hrs**

Different types of database users, functions of Database Administrator (DBA), basic-concepts - Primary keys, foreign key, super key, definition of E-R diagram, symbols used in E-R Diagram, E-R diagram for Banking enterprise, E-R diagram for Book store, types of entities, entity sets, attributes, types of attributes, weak entity sets, cardinality ratios (mapping cardinality).

Unit 3- Relational Model: **10 hrs**

Fundamental operations of Relational algebra - select, project, union, set difference, join, division operations (explanation with examples). Types of aggregate functions – MAX, MIN, SUM, COUNT and AVERAGE (Definition with example).

Unit 4- SQL: **09 hrs**

Definition of Query, explanation of basic structure of SQL – Select, from and where clauses in SQL, data types in SQL, explanation of set operation in SQL – Union, intersection, except, NULL values.

Unit 5: Relational database design: **09 hrs**

Pitfalls in relational database design, definition of Normalization, Various types of Normal forms (Definitions only) – First Normal form, Second Normal form, Third Normal form, Boyce-Codd Normal Form (BCNF).

Reference Books:

1. Korth, Sudarshan “Database System concepts”, Mcgraw Hill-IV Edition.
2. Navathe, Silberchatz and Elmasri “fundamentals of database Systems”-Addison Wesley
3.C.J. Date “Introduction to Database systems” Addison-wesley.
4. Bipin C Desai “Introduction to Data base system” Galgotia publications

QUESTION PAPER PATTERN FOR IV SEMESTER B.Sc (Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: SQL LAB

I. Use default emp and dept tables to write SQL statements for followingqueries
1. Find the employee details in ascending order of their name and descending order of their salary
2. Find names of all employees whose name starts with ‘s’ and having atleast 6 characters in it
3. Find the name of all managers and number of employees under them
4. Find the details of all employees in the research department
5. Find the minimum, maximum and average salary of each department
6. Find department name having least number of employees
7. Find the department name having highest annual payroll
8. Add an employee under the manager smith
9. Find the employees who are not getting commission

II. Create tables as below
Student(name string, regno string primary key, dob date, doj date ,course string foreign key)
Markscard(regno foreign key, sem string, sub1 number, sub2 number, sub3 number, tot number, avge number, result string)
Write SQL statements for the following queries.
1. List the names of students studying in BCA course in the order of their joining
2. Find the name of student who has scored highest marks in every sem of each course
3. Count the number of students in each course
4. Find the course having second highest number of students
5. Find the course having least students in I semester
6. Raise marks of sub3 in III sem BCA students by 5% if the student has failed in that subject
7. Display the details of student ‘xxx’ in every semester.
8. Find the names of al juniors of ‘yyy’ in course ‘c1’
9. Find all students studying with ‘xxx’ and elder to him (compare DOB)

III. Dept(deptno integer pkey, dname string not null, loc string not null)
Emp(eno integer pkey, ename string, deptnofkey, desgn string not null, bsal number>0)
Salary(enofkey,da,hra,gross,it,pf,net,comm)
Designations are: manager,clerk,salesman
Comm=5% of basic if desgn=salesman otherwise null
Da=15% bsalhra = 7% of bsal gross=bsal+da+hra
It =0 if gross<15000
= 10% of gross if gross between 15000 and 30000
=20% of gross if gross between 30000 and 50000
= 30% of gross otherwise
pf = 10% of gross or 1000 whichever is less
Write SQL statements for
1. Count the number of employees in every designation
2. List the employees of every department in descending order of their net salary
3. List the name and salary of highest salary payer in every department
4. List the name of employee paying highest IT
5. List the total IT paid by each department
6. List the departments in every location
7. Raise the basic salary by 10% for the managers of every department.
8. Find number of employees having at least 10 years of experience in every department.
9. Count the number of employees who are not getting commission in every department

PRACTICAL EXAM SCHEME

Practical Proper - 30 Marks
Table creation & data insertion =10 marks
SQL queries- 4 X 5 marks =20 marks[Queries writing 3 marks (each) and Execution 2 marks (each)]
Viva – voce - 05 Marks
Record - 05 Marks

FIFTH SEMESTER BSc (Computer science)
Computer Science -V

BSC-5.1 JAVA PROGRAMMING

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to Java: **12 hrs**

History of Java, Java features, Difference between C/C++ and Java, Java program structure, Java tokens, Statements, JVM, Java and Internet, Java and WWW, Web browsers, Java support system, Java Development Kit (JDK), Application Programming Interface(API), Java Runtime Environment (JRE).Introduction to packages in Java, Applets, Operators & Expressions, Data types, Constants and Variables, Type conversions, Mathematical functions; Control Statements: Decision making and Branching with while, do-while, for and labeled loops; Arrays, Vectors & Strings: Initialization, Declaration

Unit 2-Overview: **10 hrs**

Class, Objects, Constructor, Method overloading, Static members; Inheritance: Single, Multilevel, Hierarchical, Visibility modes, Method overriding, Final variable, Abstract methods and classes; Interface: Defining, Extending and implementing assigning interface variables

Unit 3-Packagesand multithreading: **10 hrs**

Java API Packages, using system packages, naming convention, accessing and using a package, adding a class to packages, hiding classes. Multithreaded programming: Creating a thread, extending the thread class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the runnable interface.

Unit 4-Exceptions and Debugging: **08 hrs**

Meaning of errors and exceptions, Dealing with errors, Classifications of exceptions, syntax of handling exceptions, advertising the exceptions, throwing and re-throwing exceptions, creating Exception classes, multiple catch statements, finally clause, Debugging techniques – tricks for debugging, Assertions, Java Debugger (JDB).

Unit 5-Applets and Graphics: **08 hrs**

Applets basics, applets and application, Life cycle, Life cycle of Applet programming- passing parameter to applets, paint and repaint methods, Graphics class, Line, Rectangle, Circle, Ellipse, Arcs and Polygon, drawing bar charts.

Reference Books:

1.Programming with Java- A primer, 4th Edition, by E Balaguruswamy.
2.The Complete Reference – Patrick Naughton and Schildt
3.Programming in Java – Joseph L Weber

QUESTION PAPER PATTERN FOR V SEMESTER B.Sc (Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: JAVA PROGRAMMING LAB

1. Write a Java program to generate first n odd numbers and pick and display prime numbers among them. Read value for n as command line argument.
2. Write a Java program to create a vector, add elements at the end, at specified location onto the vector and display the elements. Write an option driven program using switch…case.
3. Write a java program to find area of geometric figures using method overloading.
4. Write a Java program to find the circumference and area of the circle using interface.
5. Write a java program to sort the alphabets in the given string.
6. Write a java program to accept student information using array of objects and constructor initialisation.
7. Write a java program to implement constructor overloading by passing different number of parameter of different types.
8. Write a program to implement an applet by passing parameter to HTML
9. Write an applet program to display human face
10. Create an applet to display concentric n circles, input value for n.

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Flowchart/Algorithm 05 Marks
- ✓ Program Writing 15 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

FIFTH SEMESTER BSc (Computer science)

Computer Science -VI

BSC-5.2 UNIX PROGRAMMING

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1.Introduction to Operating system: 10hrs

Definition of OS, functions of operating systems. Early systems – Simple monitors, Batch Systems, Multiprogramming, Time Sharing, Real time, Parallel and Distributed systems Scheduling concepts, Scheduling algorithms: FCFS, Shortest job first, priority scheduling, round robin, Definition of deadlock problem, deadlock characteristics, deadlock prevention and avoidance. File concept –allocation and access methods, directory structures, Contiguous allocation.

Unit 2- Introduction to Unix : 08 hrs

The Unix operating system, , A brief Session, The Unix Architecture, Features of UNIX, POSIX and Single UNIX specification, Locating commands, Internal and External commands, Command Structure, Flexibility of command Usage, Man Browsing the Manual Pages ON-line, Understanding the man Documentation. General-Purpose Utilities: Cal command, date command, echo, printf, bc, script, passwd, who, uname

Unit 3- The File System in Unix: 10 hrs

The file, The Parent –Child Relationship, The HOME Variable, pwd, cd, mkdir, rmdir, Absolute Pathname, Relative Pathname, ls, The Unix File system. Handling Ordinary Files: Cat, cp, rm, mv, more, Thelp subsystem: Printing a File, File, wc, od, cmp, comm, diff, dos2unix and unix2dos, compressing and archiving files, gzip, and gunzip, tar, zip and unzip. Basic File Attributes: Listing file attributes, listing directory attributes, File Ownership, File Permissions, changing file permissions, Directory Permissions, Changing File Ownership

Unit 4-The Vi Editor 10 hrs

Vi basics, Input Mode, Saving Text and Quitting, Navigation, Editing Text, Undoing Last Editing Instructions(U and U), Repeating the last command(.), Searching for a Pattern(/ and ?), Substitution

Unit 5-The Shell 08 hrs

The shell's Interpretive Cycle, Shell Offering, Pattern Matching, Escaping and Quoting, Redirection, /dev/null and /dev/tty, Pipes, tee, Command Substitution, Shell variables. Essential shell programming: Shell scripts, read, using command line arguments, exit and exit status of command, the logical operators && and ||- conditional execution, the if conditional, using test and to evaluate expressions, the case conditional, expr, $0: calling a script by different names, while, for, set and shift, the here document (<<), trap, debugging shell scripts with set –x, sample validation and data entry scripts.

Reference Books:

1. Sumitabha Das, UNIX System V.4, Concepts and Applications, TMH.
2. Operating systems concepts, Korth

QUESTION PAPER PATTERN FOR V SEMESTER B.Sc(Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: UNIX PROGRAMMING LAB

1. Write a shell script program to perform all arithmetic operation on floating point.
2. Write a shell script program to check whether the given number is positive or negative.
3. Write a shell script program to reverse a number.
4. Write a shell script program to find sum of digit of a number.
5. Write a shell script program to find the sum of the series (sum= 1 + ½ +.....+1/n)
6. Write a shell script program to add, subtract and multiply the two given number passed as command line argument.
7. Write a shell script to count number of characters in a given string
8. Write a shell script program to read pattern and file name and search whether the given pattern in a file or not.
9. Write a shell script to read filename from command line argument check whether the file is regular file or directory or by both.
10. Find the number of directory file and ordinary files in the current

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Flowchart/Algorithm 05 Marks
- ✓ Program Writing 15 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SIXTH SEMESTER BSc

Computer Science -VII

BSC-6.1 ADVANCED JAVA PROGRAMMING

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1-Review of Java Concepts and AWT, Graphics Programming: 10 hrs

Review of Java Concepts .AWT and AWT Classes, Window fundamentals – Component, Container, Panel, Window, Frame, Canvas.Working with frame window. GraphicsProgramming: Graphics class, methods, drawing objects, line graphs, polygon classes,working with colours and fonts. Advanced graphics operations using Java2D.Designing,simple User Interfaces (UIs) using AWT, Layout Manages.

Unit 2- Swings and event handling: 10 hrs

Event Handling: Basics of Event Handling, the delegation event model, AWT event hierarchy and event classes, Event Listener Interfaces, Adapter Classes, Event queue. Swing: Meaning, need, difference between AWT and swing. The Model-View-Controller (MVC) designpatterns, Creating simple UIs using swing, and handling basic events.

Unit 3-Java Beans, Java Archives (JAR): 08 hrs

Meaning and need of Java Beans, Advantages, Bean writing process, Bean properties. Java Archives (JARs): Meaning, need, the JAR utility, Creating JAR files.

Unit 4-File Management and JDBC: 10 hrs

File, creating a file, writing to a file, opening a file, reading from a file, file management, checking existence of a file, deleting a file.JDBC: Meaning, need, concept and structure of JDBC, relation with ODBC, JDBC driver types and their meaning, the JDBC process – loading the driver, connecting to the DBMS, creating and executing SQL statement, Connection object, Statement object, Prepared Statement object, Callable Statement, Result Set, JDBC Exceptions.

Unit 5-Basic concepts of Collections, Generics and Network programming: 10 hrs

Collections: Meaning, need, Collection interfaces, Concrete Collections – Array List, Hash set, Map. Generics: Meaning, need, benefits, generics usage, basics of generic types, type parameter naming conventions, type wildcards, using type wildcards, generic methods, bound types, writing simple generic container, implementing the container, implementing constructors, implementing generic methods.

References:

1.Complete Reference – Java 2:Herbert Schildt, 5th / 7th Edition, Tata McGraw-Hill
2.Thinking in Java: Bruce Eckel
3. Core Java 2: Volume I – Fundamentals: Cay S. Horstmann, Gary Cornell, Pearson Education Asia.
4.Core Java 2: Volume II – Advanced Features: Cay S. Horstmann, Gary Cornell

QUESTION PAPER PATTERN FOR B.Sc(Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: ADVANCED JAVA PROGRAMMING LAB

1. Write an applet to add, remove, select an item in a list
2. Write an applet to display selected geometric figure from a list.
3. Write a program to implement mouse events
4. Write a program to implement keyboard events
5. Write a Java program (console) to store the typed text to a file.
6. Write a Java program to display the content of a file.
7. Write a Java program with JDBC to store the details of a person on to an Oracle database table.
8. Write a Java program with JDBC to access and display the details of a person stored in an Oracle database table.
9. Write a Java program with JDBC to access and delete the details of a given person stored in an Oracle database table.
10. Write a Java program to demonstrate the use of generics.

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
  - ✓ Program Flowchart/Algorithm 05 Marks
  - ✓ Program Writing 15 Marks
  - ✓ Correct output with proper display 10 Marks
    (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SIXTH SEMESTER BSc

Computer Science -VIII

BSC-6.2 SOFTWARE ENGINEERING AND COMPUTER NETWORKS

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to Software Engineering: **10 hrs**

IEEE definition of Software and Software Engineering, Software Problems, Software engineering challenges, Software quality attributes, phases in software development (Phased Development process), Definition of Software process, Components of software process, desired characteristics of software process, Software development process models- waterfall model, prototype model and spiral model .

Unit 2- Software design: **09 hrs**

Definition of SRS, need for SRS, Characteristics of SRS, Structure of SRS, design objectives ,design principles, module level concepts – coupling and cohesion.

Unit 3- Coding and testing : **09 hrs**

Definition of Coding, Programming principles and guidelines, top down and bottom-up Approaches, definition of testing, testing fundamentals, levels of testing, Difference between black box testing and white box testing.

Unit 4-Introduction to Computer networks Network Hardware: **10 hrs**

Definition of computer network, Goals of computer network, Types of Networks based on transmission technology - Broadcast, point- to -point, Types of Networks based on size & scale - LAN, WAN, MAN, Protocol hierarchies (Network software), Network topologies – Bus, Mesh, Ring, tree and star.

Unit 5- Network Software, Reference models and Transmission Media: **10 hrs**

Reference models - OSI / ISO model, TCP / IP model, ARPANET,Transmission Media - twisted pair, coaxial cable, fiber optics cable, Internet and its applications, Wireless media - Bluetooth, Wi-Fi, internet and its applications

References:

1. An integrated approach to Software Engineering: PankajJalote.

2. Software Engineering a practitioners approach: Roger Pressman.

3. Computer Networks:5th Edition, Andrew S Tanenbaum.

QUESTION PAPER PATTERN FOR B.Sc(Computer science)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: PROJECT LAB

PROJECT LAB EXAM SCHEME

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories. The project is of 3 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The Project work should be either an individual lone or a group of not more than five members.

The project proposal should include the following:

- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The examiner will evaluate the project work as follows:

- Project Report - 10 Marks
- Project Demo - 10 Marks
- Viva-Voce - 20 Marks

KUVEMPU UNIVERSITY

Revised syllabus

BCA, B. Sc (Computer Science) and BA (Computer Applications)

W.E.F 2019-20

DEPARTMENT OF P.G. STUDIES AND RESEARCH IN COMPUTER SCIENCE,

JANNASHAYADRI , SHAKARGHATTA

SHIMOGA, KARNATAKA

Regulations for BCA course

Eligibility for Admission

1. A candidate who passed the three year Diploma in the branch of computer science, examination conducted by the board of Technical education, Government of Karnataka, shall be eligible for admission to first semester of BCA degree course.

2. A candidate who passed the two-year Pre-University examination in science/commerce of Karnataka state or any other examination considered as equivalent are eligible for admission to the first semester of BCA degree course.

3. A candidate who passed the three year Diploma in the branch of computer science, examination conducted by the board of Technical education, Government of Karnataka, shall be eligible for Lateral admission to the Third semester of BCA degree course.

4. Computational Mathematics-I and II Subjects should be taught by Computer Science Faculty

NEW SYLLABUS FOR BCA (EFFECT FROM 2019-20)

Semester	Paper	No of Hours (Theory)	No of Hours (Practical)	IA	External
I	English	4	-	20	80
	Kannada / Hindi/ Sanskrit/ Urdu	4	-	20	80
	Computational Mathematics - 1	4	-	20	80
	Computer Fundamentals	4	-	20	80
	Introduction to Information Technology	4	-	20	80
	Programming Fundamentals & C-Programming	4	-	20	80
	Excel & C Lab	-	3	20	80
	TOTAL			**140**	**560**
II	English	4	-	20	80
	Kannada/Hindi/ Sanskrit/ Urdu	4	-	20	80
	Computational Mathematics - 2	4	-	20	80
	C & Linear Data Structures	4	-	20	80
	Database Management System – 1	4	-	20	80
	Digital Fundamentals	4	-	20	80
	DS & Advanced Excel Lab	-	3	20	80
	TOTAL			**140**	**560**
III	English	4	-	20	80
	Kannada / Hindi/ Sanskrit/ Urdu	4	-	20	80
	Non Linear Data Structures using C++	4	-	20	80
	Database Management System – II	4	-	20	80
	System Software	4	-	20	80
	DS Lab Using C++	-	3	20	80
	SQL Using MYSQL	-	3	20	80
	TOTAL			**140**	**560**
IV	English	4	-	20	80
	Kannada / Hindi/ Sanskrit/ Urdu	4	-	20	80
	Java	4	-	20	80
	PL/ SQL and Data Warehousing	4	-	20	80
	Software Engineering	4	-	20	80
	Java Lab	-	3	20	80
	PL/ SQL & DW Lab	-	3	20	80
	TOTAL			**140**	**560**
V	Advanced programming in java	4	-	20	80
	Web Programming	4	-	20	80
	Operating System	4	-	20	80
	Data Communication	4	-	20	80
	Computer Networks	4	-	20	80
	Advanced java Lab	-	3	20	80
	Web Programming Lab	-	3	20	80
	TOTAL			**140**	**560**
VI	Unix Operating System	4	-	20	80
	. Net Programming	4	-	20	80
	Elective - 1 Digital Image Processing / Cloud Computing	4	-	20	80
	Elective – 2 Computer Graphics/ Operation Research	4	-	20	80
	Unix & Net Lab	-	3	20	80
	Project Lab	-	3	20	80
	TOTAL			**120**	**480**

BCA - 1.3 : Computational Mathematics - 1

PART- A

Unit-1 Sets, Relations and Functions 12 hrs

Definition of a set, sub-set with examples, Venn diagrams, types of sets-equal sets, null set, disjoint sets, finite set, infinite set, power set, cardinality of set. Operations on sets-union and intersection of two sets, complement of a set, difference of two sets, symmetric difference of sets. Algebraic properties of set operations, strings and regular expressions. Definition of a relation with examples, types of relations-empty, universal, trivial, equivalence, reflexive, symmetric, transitive relation (definition and examples only, no problems). Definition of a function with examples, types of function, one-to-one (injective).Binary operation - commutative, associative, identity and invertible (definition and examples only, no problems).Functions for computer science - characteristic function, floor function and ceiling function.

Unit-2 Logic and Reasoning 12 hrs

Definition of proposition or statement, proposition variables, negation of statements, truth table, conjunction, disjunction, implications quantifiers- predicate, universal quantifier, universal quantification, existential quantification. Conditional statement/implication, contrapositive and converse, equivalence or bi conditional, tautology, contradiction, logical equivalence, properties of proposition operation-commutative, associative, distributive, idempotent negation. Simple problems on tautology and equivalence. Rules for validating statements

PART- B

Unit-3 Mathematical Induction and Counting 12 hrs

Principle of mathematical induction, simple problems on principle of mathematical induction. Fundamental principle of counting (statement with examples only), permutations-definition and simple problems. Combinations - definition and simple problems. Pigeon hole principle- statement and proof, extended pigeonhole principle- statement and proof.

Unit-4 Matrices and Determinants 12 hrs

Definition of matrix and order of matrix, types of matrices-column matrix, row matrix, square matrix, diagonal matrix, scalar matrix, identity matrix, zero matrix(definition and examples only, no problems),equality of matrices(definition and examples), simple problems on equality of matrices. Operations on matrices-addition, subtraction, product of two matrices, scalar multiplication of a matrix, inverse of a matrix, simple problems on these operations. Matrices applications in computer science.

Definition of determinant (definition and examples), determinant of matrix of order one , order two and order three(simple problems), properties of determinant(examples only, no verification),applications of determinants and matrices for solving the system of linear equations of two variables and three variables(simple problems),applications of determinant and matrices for checking the system of linear equations for consistency and inconsistency(simple problem).

Refences:

1. Text book of Mathematics – Shanthi Narayan

2. Text book of Mathematics – S. Lipschutz

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit3 and unit4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
3. Each question must contain sub-questions-(a),(b),…
4. The student has to attend any 05 full questions (16*5).
5. The student has to attend at least one question from each unit.

BCA 1.4 COMPUTER FUNDMENTALS

PART- A

Unit 1- Introduction to Computer Systems **12 hrs**

Definition of a Computer, History of Computers, Generations of Computers, classification Of Computers, Applications of Computer, Capabilities and limitations of computer. Block diagram of a Computer with functional units (explanation), Parts of a computer system with peripherals (explanation of peripherals), and essential computer hardware , Information processing Cycle. Input and output device**:** Input devices-key board mouse (explanation with diagram and working), output devices, monitors types of monitors, types of printers – line and page printers, laser printer – working, advantages and disadvantages. Representation of data, text code -EBCDIC, ASCII, UNICODE.

Unit 2 Computer Organisation & Storage Device **12 hrs**

Basic computer organization, bus Architecture and types .Primary Vs Secondary Storage, Primary Storage: RAM – SRAM, DRAM, SDRAM, DDR. ROM - PROM, EPROM, EEPROM, cache memory. Secondary Storage: Magnetic Tapes, Magnetic Disks. hard disks, Zip Drive, Flash Drives.

PART -B

Unit 3- MS Word and Power point **12 hrs**

MS Word**:** Working with documents, formatting documents, Setting page style and page layout, Creating Tables, Printing documents, Mail merging.

Power point**:** Introduction to presentation, Creating presentation, Formatting presentation, Adding effects to presentation, Printing Handouts.

Unit 4 –MS Excel **12 hrs**

Spread sheet and its applications, Data Formatting, Working with sheets, insertion and deletion of rows, columns and sheets, using formula in workbooks, creating charts, cell validation, filters.

References:

1. Computer fundamentals- V Rajaraman
2. Computer fundamentals- P B Kottur

GENERAL INSTRUCTIONS FOR PAPER SETTING

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5. The student has to attend at least one question from each unit.

BCA 1.5 INTRODUCTION TO INFORMATION TECHNOLOGY

PART- A

Unit 1-Software **12 hrs**

Definition of software, types of software - application software, general purpose and specific purpose, scientific and business software examples. System software - operating system, assembler, compiler, interpreter, linker, loader. Classification of programing languages - machine level, assembly level, high level languages, event driven, object oriented - advantage and disadvantages examples.

Unit 2. Computer Networks **12 hrs**

Definition, uses of network, applications of computer networks, types of network- point-to-point, broad cast, LAN, MAN, WAN network topology, introduction to different protocols (TCP/IP, SNMP, SMTP, FTP, HTTP, Telnet, ARP, DNS, Gopher, POP), network transmission Media (twisted pair, co axial, optical fiber), definitions of network interface card (NIC), Hub, Bridge, Switch, Router, Bandwidth, internet and its applications, understanding world wide web - how the web works, web browsers – examples, features, Telecommunication overview, Client server.

PART- B

Unit -3 E-Commerce **12 hrs**

Defining commerce , main activities of electronic commerce, benefits, goals, components, functions, process management, service management, transaction capabilities, types, scope.

Unit – 4 Introduction to clouds, big data and IOT **12 hrs**

Cloud- introduction, cloud computing at a glance. Vision of cloud computing, defining a cloud, characteristics, advantages, disadvantages, examples. Big Data – meaning, 3Vs in big data, challenges. IOT- meaning, compoonents, scope, IOT in education.

References:

1. Computer fundamentals- V Rajaraman
2. Computer fundamentals- P B Kottur
3. Mastering Cloud. Computing - RajKumarBuyya, Christian Vecchiola and ThamaraiSelvi
4. Ecommerce concepts and applications – NidhiDhavan

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
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BCA 1.6: PROGRAMMING FUNDAMENTALS & C

PART -A

Unit 1-Problem Solving Techniques: 12 hrs

Problem solving techniques – problem definition, analysis, design, debugging, testing, documentation and maintenance. Design Tools - ALGORITHM: definition, characteristics, advantages and disadvantages. FLOWCHART - definition, symbols, advantages and disadvantages. Writing an algorithm and flowchart : Area of circle, arithmetical operations, simple interest and compound interest, quadratic equation, largest of three numbers, sum of N natural numbers, factorial of number, Fibonacci series, prime number, reverse a given number, evaluation of series like sin(x), cos(x), e^x, log(x) etc.

Unit 2- C Basics 12 hrs

History of c-programming, Features, basic program structure, character set, tokens, keywords and identifiers. Constants, variables, data types, variable declaration, symbolic constant definition.

PART - B

Unit 3 - Operators 12 hrs

Arithmetic, relational, logical, assignment, increment and decrement, conditional, bitwise and special operators, Arithmetic expressions, precedence of operators and associatively. Type conversion(implicit and explicit) and mathematical functions. Managing I/O operations – reading and writing a character, formatted and unformatted I/O.

Unit 4- Decision making, branching and looping 12 hrs

Decision making - if and if-else statement, nested if, else if ladder, switch statements, conditional operator, goto statement. Looping - while, do-while and for, nested for. break and continue statements. Programs on these concepts.

References :

1. Computer Concepts and Programming, *Padma Reddy*
2. Let us C , Yashwanth Kanetkar
3. Ansi C, *Balagurusamy*
4. Problem solving with C, M. T. Somashekara and D. S. Guru

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit3 and unit4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
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5. The student has to attend at least one question from each unit.

BCA 2.3 - Computational Mathematics -II

PART -A

Unit 1 - Graph theory **12 hrs**

Definition of graph, graph as models, matrices and isomorphism, graph terminologies- definitions, properties and examples, Decomposition and special graphs. Paths, cycles and trails -connection in graphs, bipartite graphs, Eulerian circuits. Vertex, degree, bijections paths, cycles and trails-connection in graphs,

Unit 2 : Directed Graphs **12 hrs**

Definition of directed graph, properties and examples, vertex degrees, Trees and distance-basic properties, properties of trees, distance in trees and graphs, disjoint spanning trees, spanning trees and enumeration of trees, Hamilton paths and circuits, Decomposition of graphs, special graphs. Optimization and trees-minimum spanning tree, shortest paths, trees in computer science.

PART- B

Unit 3 - Statistics **12 hrs**

Definition, scope, characteristics, functions and limitations of statistics. Basic concepts-units/individuals, populations/universe, sample, variable, attribute, discrete variable, continuous variable, qualitative data and quantitative data. Stages of Statistical method – collection, organization presentation, analysis and interpretation of data. Classification of data - definition, objectives, types of classification, frequency, class frequency, frequency distribution ,discrete frequency distribution, continuous frequency distribution, inclusive class and exclusive class, class limits, correction factor, open-end frequency distribution, mid-point or class mark, width/size of class, number of classes, cumulative frequency, frequency density, construction of FDT for discrete and continuous data. Tabulation-definition, objectives, types of tables-one way/simple, two way and manifold tables.

Unit 4 : Central Tendency **12 hrs**

Definition, average, arithmetic mean, mode, median, geometric mean and harmonic mean, advantages and limitations. Simple problems on arithmetic mean, geometric mean and harmonic mean. Measures of Dispersion - range, range coefficient, mean deviation, mean deviation coefficient and standard deviation, standard deviation coefficient (definitions only). Problems on mean deviation, mean deviation coefficient and standard deviation, standard deviation coefficient.

Reference s:

1. Introduction to Graph theory by S.Lipschutz
2. Statistics and probability by B.M Aggarwal
3. Statistics by Rajmohan

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit3 and unit4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
3. Each question must contain sub-questions-(a),(b),…
4. The student has to attend any 05 full questions (16*5).
5. The student has to attend at least one question from each unit.

BCA 2.4: C and Linear Data Structures

PART -A

Unit 1- Arrays and Functions **12 hrs**

One and two dimensional arrays, array initialization. Strings - declaration and initialization of string variable, reading and writing strings, string handling functions. Functions – Need, syntax of function declaration, all types of functions, nesting of functions, categories, parameter passing mechanism, function with arrays.

Unit 2- Pointers & Structures **12 hrs**

Pointer arithmetic, dynamic memory allocation, command line arguments. Structure-Definition, declaration, accessing structure members, structure with in structure, example programs, structure with array, union and difference between structure and union with example programs, typedef, enum

PART -B

Unit 3-Stack **12 hrs**

Definition of data structure, types(primitive, non primitive-linear and nonlinear).Linear data structure-Stack: Definition and example, operations, representation of stack in C, evaluation of postfix expression, conversion from infix to postfix using stack table. Recursion: Recursive definition, and process, Recursion in C, writing Recursive programs- factorial. GCD, tower of hanoi, fibanocci, binomial coefficient, efficiency of recursion

Unit 4 –Queue and Linked List **12 hrs**

Queue – Definition, operations, representation of queue in C. Types- circular queue, double ended queue. Linked list - Definition and example, insert and delete (any where), search, count and display, . Circular linked list and doubly linked list (concepts only).

References :

1. Computer Concepts and Programming, *Padma Reddy*
2. Let us C – Yashwanth Kanetkar
3. ANSI C, -*Balagurusamy*
4. Data structures using C and C++ - Yedidyiahetal
5. Programming in ANSI C - E.Balaguruswamy
6. Data structures and programming design using C - Robert Kruse PIII publications
7. Data structures and applications - Trembly and Sorenson
8. Systematic approach to data structure – Padma Reddy

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
3. Each question must contain sub-questions-(a),(b),…
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5. The student has to attend at least one question from each unit.

BCA-2.5 DATABASE MANAGEMENT SYSTEM-I

PART- A

Unit 1-Introduction **12 hrs**

Definitions of Data, database, database system, DBMS, examples, database system applications. Meaning of data and information, database management system vs. file management system, views of data, data independence, data models, database languages, database users and administrators, database system structure, application architecture, advantages of using DBMS, classification of DBMS, meaning of schema and instance.

Unit 2 -E-R Model **12 hrs**

Basic-concepts, Definition of Data Models, Using high-level, conceptual data models for database design, , constraints, keys, an example database application, E-R diagram, types of entities, entity sets, attributes, types of attributes, weak entity sets, cardinality ratios (mapping cardinality), Definition of Ordinality, specialization, generalization. Differences between specialization and generalization.

PART- B

Unit 3 –Relational Model **12 hrs**

Structure of relational Databases, Relational algebra - select, project. union, set difference, rename, division operations, Modification of the database, queries using relational algebra. Extended relational algebra operations.

Unit 4 - SQL **12 hrs**

SQL- Background, basic structure, set operation, aggregate functions, NULL values, nested sub queries, Views, complex queries, Modification of the database, joined relations, Data Definition Language**,** domain constraints, referential integrity in SQL. Assertions, authorization, privileges in SQL.DDL Commands.

References:

1. Korth, Sudarshan “Database System concepts”, Mcgraw Hill-IVEdition.
2. Navathe, Silberchatzand Elmasri “fundamentals of database Systems”
3. Addison C.J. Date “Introduction to Database systems” Addison-wesley.
4. Bipin C Desai “Introduction to Data base system” Galgotia publications

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
3. Each question must contain sub-questions-(a),(b),…
4. The student has to attend any 05 full questions (16*5).
5. The student has to attend at least one question from each unit.

BCA-2.6 DIGITAL FUNDAMENTALS

PART- A

Unit 1- Number System and Boolean Algebra **12 hrs**

Binary number system, decimal number system, octal number system, hexadecimal number system. Bases inter conversions. Representation of negative numbers - 1's and 2's complements. Codes - BCD, GRAY, EXCESS-3. Laws of Boolean algebra, Evaluation of Boolean expression, De Morgan's theorems and proof, simplification of Boolean expressions using Boolean laws, Basic gates (AND, OR, NOT): truth table, Definition, Boolean expression and symbols, universal gates (NAND, NOR) : truth table, definition, Boolean expression and symbols, SOP and POS form, min term and max term, expression of Boolean equation in Min and Max term(conversion of SOP and POS forms to standard form)

Unit 2- Logic Systems and K- Map **12 hrs**

Realization basic gates using NAND and NOR gates. Realization of Boolean expression using basic gates and universal gates. XOR and XNOR gate (working, Boolean expression, symbol and truth table), **K-map method: Rules,** simplification of Boolean equation using K-map (up to 4 variables), without and with don't-care condition, Implementation using basic gates and universal gates, Quine-McCluskey Tabulation method to determine and select essential prime implicantes.

PART- B

Unit 3-Combinational Logic: **12 hrs**

Half adder and full adder, half subtractor and full subtractor. Code converters - BCD to Excess 3 and BCD to gray code, magnitude comparator, encoders (BCD to decimal), decoder (decimal to BCD), multiplexer(4:1 and 8:1), de-multiplexer(1:4 and 1:8).

Unit 4-Sequential Logic: **12 hrs**

Introduction, Flip-flops – SR, JK, D, T, JK-MS (Detailed Study) Registers – Introduction, shift register- types and applications. Counters – synchronous and asynchronous counters (Up, down, up down and Mod counters(asynchronous only)) with timing diagram.

References:

1. Digital Logic and Computer Design- M. Morris Mono
2. Digital fundamentals – B.Basavaraj
3. Digital fundamentals – L Krishnananda

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
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5. The student has to attend at least one question from each unit.

BCA -3.3 Non Linear Data Structures using C++

PART- A

Unit 1 - Introduction to C++ and OOPS **12 hrs**

Object Oriented Programming paradigm, Limitations of structures in C, Basic concepts of Object Oriented Programming- Classes, Objects, Data Abstraction and Encapsulation, Polymorphism, Inheritance, Dynamic binding, Message passing, Benefits of OOP, Object Oriented languages, applications of OOP.C++ features, Comparison with C, Structure of a C++ program, input and output statements Keywords, Data types, symbolic constants, type compatibility, declaration of variables, reference variables, operators in C++, control structures.

Unit 2 - Classes Objects, Member Functions And Constructors- Destructors **12 hr**

Specifying a class, creating objects, memory allocation for objects, static data members, arrays within a class, local classes. Defining member functions, call by reference, return by reference, inline functions, default arguments, making an outside function inline, nesting of member functions, private member functions, function overloading, static member functions, const member functions, pointer to members, friend and virtual functions. Constructors, parameterized constructors, multiple constructors in a class, constructors with default arguments, copy constructor, dynamic constructors. Destructors.

PART- B

Unit 3–- Operator overloading And Inheritance **12 hr**

Overloading unary operators, overloading binary operators, overloading operators using friends, string manipulations using operators, rules for operator overloading, type conversions. Inheritance definition, defining derived classes, types-single inheritance, making a private member inheritable, multilevel inheritance, multiple inheritance, hierarchical inheritance, hybrid inheritance, virtual base classes.

Unit 4 – Trees And Sorting **12 hrs**

Tree terminologies, Binary tree, binary tree representation, types of binary tree - linked representation, tree traversals, and binary search tree and their applications, algorithm on searching element in a binary search tree, linear search and hashing, Quick sort, insertion sort, shell sort, radix sort, tree sort, heap sorting.

References:

1. E Balguruswamy, Data Structures using C
2. RB Patel, Expert Data Structures with C++, Khanna book publishing
3. YashwanthKanatkar, Data Structures through C

GENERAL INSTRUCTIONS FOR PAPER SETTING

1. In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
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5. The student has to attend at least one question from each unit.

BCA-3.4 DATABASE MANAGEMENT SYSTEM- II

PART -A

Unit 1- Relational Database Design **12 hrs**

Review of relational algebra and relational calculus concepts, Pitfalls in relational data base design, Normalization for relational databases. Normal forms based on primary keys, General definitions of first, second and third normal forms, Functional Dependency (concept and example) decomposition, Boyce-Codd Normal Form - definition and example, fourth Normal form - Multi valued Dependencies - definition and example.

Unit 2 - Storage and File Structure **12 hrs**

Overview of physical storage media, MAGNETIC AND FLASH DISKS – performance measure of a disk optimization of disk block access, RAID, improvement of reliability via redundancy, improvement of performance via parallelism RAID levels, choice of RAID level, File organization – fixed and variable length records, organization of records in files, Data dictionary, Indexing and hashing – basics , Ordered indices, , B+ index files, structure of B+ index tree.

PART- B

1.

Unit 3- Transaction management and Recovery system **12 hrs**

Transaction management- Concepts, simple transaction model, storage structure, transaction atomicity and durability. Recovery system- Failure classification, storage, recovery and atomicity- log records, data modification, concurrency control and recovery, transaction commit (concepts).

Unit 4 - PL/SQL **12 hrs**

Features of PL/SQL, Advantages of PL/SQL, basic syntax, data types and Subtypes. Variables -: declaration, initializing variables, variable scope, assigning SQL query results to PL/SQL variables. Constants And Literals: Declaring a Constant, The PL/SQL Literal, Operators, Precedence, Conditions: IF-THEN and it's flavours, CASE Statement, Searched CASE Statement, Basic Loop Statement, WHILE LOOP Statement, FOR LOOP Statement, Reverse FOR LOOP Statement, Nested Loops, Labeling a PL/SQL Loop, The Loop Control Statements, EXIT Statement, The EXIT WHEN Statement, CONTINUE Statement, GOTO Statement, STRINGS: Declaring String Variables, String Functions and Operators, ARRAYS: Creating a Varray Type.

References:

1. Data base system concepts - Korth , Sudarshan 6th Edition
2. Muruch's Oracle SQL and PL/SQL
3. Oracle Database 11G PL/SQL Programming

GENERAL INSTRUCTIONS FOR PAPER SETTING

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5. The student has to attend at least one question from each unit.

BCA 3.5 SYSTEM SOFTWARE

PART- A

Unit 1 -Machine Architecture **12 hrs**

Introduction, System software and machine architecture, Simplified Instructional Computers (SIC) and its architecture, Instruction Formats of IBM-360. Searching& Sorting - Linear and binary search, comparison, examples. Interchange sort, shell sort, bucket sort, radix exchange sort, address calculation sort, Random entry searching.

Unit 2-Assembler and Loader **12 hrs**

Introduction, General design procedure, design of Assembler, statement of problem, data Structure, Format of Date bases, Algorithm for pass 1 and pass 2, look for modularity. Explanation along with flowcharts for both pass 1 and pass 2 (detailed flowchart). Introduction to loader, Loader schemes-compile and go , general loader, Absolute loader, Sub routine linkage, Relocating loader, Direct linking loader, overlays, Dynamic loading.

PART- B

Unit 3 - Macro Language and macro processor **12 hrs**

Introduction, Macro instructions, Features of macro facility-macro instruction arguments, Conditional macro Expansion, Macro calls within macro, Macro instruction defining macro. Macro processor implementation: statement of problem, specification of databases and specification of database format, Algorithm and flowchart for processing macro definitions and macro expansion.

Unit 4 – Compiler **12 hrs**

Introduction, Statement of problem, Phases of compiler, Detailed study of - Lexical phase, syntax phase, interpretation phase optimization phase, storage assignment phase, code generation phase, Assembly phase, passes of compiler. Data Structures: statement of problem, storage classes and its use.

References:

1. System programming – John. J. Donovan
2. System Software – Leland L. Beck, Third edition, Addison Wesley1997
3. Systems programming and operating systems –Dhamdare

.GENERAL INSTRUCTIONS FOR PAPER SETTING

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BCA - 4.3 JAVA PROGRAMMING

PART- A

Unit 1 - Introduction to Java and Java Program Structure **14 hrs**

History of Java, Java features, Difference between C/C++ and Java, Java program structure, Java tokens, Statements, JVM, Java environment- JDK, JSL. Data types, Constants and Variables, Operators &Expressions, Type conversions, Mathematical functions; Control Statements: Decision making, Branching and looping with while, do-while, for and labeled loops; Arrays- Declaration of 1D, 2D arrays, Class, Objects, Constructor, Method overloading, Static members.
Strings-Introduction, classes and its methods.Vectors.Wrapper classes. Inheritance: Single, Multilevel, Hierarchical, Visibility modes, Method overriding, Final variable, Abstract methods and classes; **Interface**: Defining, Extending and Implementing assigning interface variables

Unit 2 –Packages and multithreading **12 hrs**

Java API Packages, using system packages, naming convention, accessing and using a package, adding a class to packages, hiding classes. Multithreaded programming: Creating a thread, extending the thread class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the runnable interface.

PART -B

Unit 3- Exceptions and Debugging **12 hrs**

Meaning of errors and exceptions, Dealing with errors, Classifications of exceptions, syntax of handling exceptions, advertising the exceptions, throwing and rethrowing exceptions, creating Exception classes, multiple catch statements, finally clause, tips for using exceptions, Debugging techniques – tricks for debugging, Assertions, Java Debugger (JDB).

Unit 4 – Applets and Graphics **10 hrs**

Applets basics, applet types, applets and application, Life cycle of an applet, applet programming-passing parameter to applets, paint and repaint methods, Graphics class, Line, Rectangle, Circle, Ellipse, Arcs and Polygon. Using control loops in applets, drawing bar charts.

References:

1. Java, The Complete Reference – Patrick Naughton and Schildt
2. Programming in Java – Joseph L Weber
3. Java Programming – E Balaguruswamy
4. Object oriented programming with Java – Mt Somashekara Ds Guru Ks Manjunath

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BCA 4.4 PL/SQL DATA WAREHOUSING

PART- A

12.

Unit 1-Procedures, Functions and Triggers **12 hrs**

15.

Parts of a PL/SQL Subprogram, Creating a Procedure, Executing a Standalone Procedure, Deleting a Standalone Procedure, Parameter Modes in PL/SQL Subprograms, Methods for Passing Parameters. Functions: Creating a Function, Calling a Function, Cursors : Implicit Cursors, Explicit Cursors, Declaring the Cursor, Opening the Cursor, Fetching the cursor, Closing the, Cursor, Exceptions: Syntax for Exception Handling, Raising Exceptions, User-defined Exceptions, Pre-defined Exceptions, Triggers: Creating Triggers, Triggering a Trigger

Unit 2– Packages, Collections and Transactions **12 hrs**

PL/SQL — PACKAGES: Package Specification, Package Body, Using the Package Elements, COLLECTIONS: Index-By Table, Nested Tables, Collection Methods, Collection Exceptions

TRANSACTIONS: Starting and Ending a Transaction, Committing a Transaction, Rolling Back Transactions, Automatic Transaction Control. OBJECT-ORIENTED: Instantiating an Object, Member Methods, Using Map method, Using Order method, Inheritance for PL/SQL Objects, Abstract Objects in PL/SQL

PART -B

Unit 3 - Data Warehousing and OLAP **12 hrs**

Data Warehouse basic concepts: ODS, ETL functions, ODS and DW architecture, Guidelines for implementing DW, Difference between ODS and DW, OLTP and DW, OLTP and OLAP, Data Warehouse Modeling, Data warehouse Schema. OLAP: Characteristics, Multi-dimensional view and data cube, Data cube operations

Unit 4 - Data Mining **12 hrs**

Introduction to Data Mining: KDD process, Architecture of Data Mining, Motivating Challenges, Data Mining Tasks, Data Mining Technologies Data Pre processing: Cleaning, integration, transformation, data reduction, data normalization. Data Mining Applications. Classification and Clusters- concepts and examples, Decision tree- concepts, algorithm, creating decision tree using information gain.

References:

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining Addison- Wesley,2005.
2. G.K.Gupta : Introduction to Data Mining with Case Studies, 3rd Edition, PHI, NewDelhi,2009
3. Arun K Pujari: Data Mining Techniques University Press,2nd Edition, 2009.
4. Jiawei Han and Micheline Kamber : Data Mining-Concepts and Techniques, II Edition, Morgan KaufmannPublisher,2006.
5. Alex Berson and Stephen J. Smith: Data Warehousing, Data Mining and OLAP Computing, Mc GrawHill Publisher,1997.

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BCA -4.5 SOFTWARE ENGINEERING

PART- A

Unit 1–Introduction **10 hrs**

Definition of software, software problems (industrial strength software, software is expensive, late and unreliable maintenance and rework), software engineering challengers (scale, quality and productivity, attributes), software engineering approach (phased development process, managing process, components.

Unit 2 –Software processes and Software Planning **14 hrs.**

Introduction to software process (processes and process modules, component of software process), characteristics of software process(predictability, support, testability and maintainability, support change, early defect removal, process improvement and feedback), and software process models (waterfall, prototype, iterative enhancement model, spiral) comparison of processmodels. Introduction to planning, effort estimation (uncertainties, building efforts, bottom-up, COCOMO model), project scheduling and staffing (overall, detailed scheduling, team structure), risk management (concepts, assessment), project monitoring plan (measurements, project monitoring and tracking).

PART- B

Unit 3 – Analysis and Design **12 hrs**

Software requirements (needs and requirement process), problem analysis (informalapproach, data flow modeling, object oriented modeling, prototyping), requirement specification (characteristics of SRS, components of SRS, specification language, structure ofrequirement document), validation. Design: Function oriented design: design principles, module level concept (coupling, cohesion), structure design methodology (DFD, first level factoring).

Unit 4 –Coding and Testing **12 hrs**

Coding: programming principles and guidelines (common coding errors, structured programming, information hiding, some programming practices, coding standards), refactoring (basic concepts with examples, common refactoring), verification (code inspections, static analysis, proving correctness, unit testing). Testing: testing fundamentals, black box and white box testing, comparison between black box and white box testing, regression testing, testing process- levels of testing, test plan.

References:

1. An integrated approach to software engineering-Pankaj Jalote.
2. Roger Pressman, Software Engineering- A Practitioner's Approach TMH
3. Ian Sommerville, Software Engineering, Pearson Publications Ltd.

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BCA - 5.1 ADVANCED PROGRAMMING IN JAVA

PART- A

Unit 1 - AWT,AdvancedGraphics Programming 12 hrs

Review of Java Concepts .AWT and AWT Classes, Window fundamentals – Component, Container, Panel, Window, Frame, Canvas. Working with frame window. Graphics Programming: Graphics class, methods, working with colors and fonts. Advanced graphics operations using Java2D. Designing simple User Interfaces (UIs) using AWT (Label, Text Field, Choice, List, Checkbox, Checkbox Group, Scrollbar, Button, Text Area, Panel), Layout Manager.

Unit 2 –Event Handling and Swings: 12 hrs

Event Handling: Basics of Event Handling, the delegation event model, AWT event hierarchy and event classes, Event Listener Interfaces, Adapter Classes, anonymous inner class, Event queue. Swing: Meaning, need difference between AWT and swing. The Model-View-Controller (MVC) design patterns, Creating simple UIs using swing (JLabel, JText Field, JCombobox, JList, JCheckbox, JScrollbar, JButton, JRadioButton, JScroll Pane, J Panel, J Tabel, J Tree, JFrame) and handling basic events.

PART- B

Unit 3 - File Management and JDBC 12 hrs

File, creating a file, writing to a file, opening a file, reading from a file, file management, checking existence of a file, deleting a file. JDBC: Meaning, need, concept and structure of JDBC, relation with ODBC, JDBC driver types and their meaning, the JDBC process – loading the driver, connecting to the DBMS, creating and executing SQL statement, Connection object, Statement object, Prepared Statement object, Callable Statement, Result Set, JDBCExceptions.

Unit 4 -Fundamental concepts of Collections, Generics and Java Beans 12 hrs

Collections: Meaning, need, Collection interfaces, Concrete Collections – Array List, Hash set, Map . Generics**:** Meaning, need, benefits, generics usage, basics of generic types, type parameter naming conventions, type wildcards, using type wildcards, generic methods, bound types, writing simple generic container, implementing container, implementing constructors, implementing generic methods. Meaning and need of Java Beans, Advantages, Bean writing process, Bean properties. Java Archives (JARs): Meaning, need, the JAR utility, Creating JARfiles.

References:

1. The Complete Reference – Java 2: Herbert Schildt, 5th Edition, Tata McGraw-Hill
2. Thinking in Java: Bruce Eckel
3. Core Java 2: Volume I – Fundamentals: Cay S. Horstmann, Gary Cornell, Pearson Education Asia.
4. Core Java 2: Volume II – Advanced Features: Cay S. Horstmann, Gary Cornell, Pearson Education Asia.

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BCA5.2 WEB PROGRAMMING

PART -A

Unit 1–Introduction **12 hrs**

Internet, WWW, Web Browsers and Web Servers, URLs, HTTP, Evolution of the Web, Peak into the History of the Web, Internet Applications, Important Components of the Web, Web Search Engines, Application Servers.HTML and DHTML Concepts : Programming structure, different basic tags , Images, Hyper text Links. Lists, Tables, Forms, Frames. Cascading Style Sheets**:** Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The box model, Background images, The and tags.

Unit 2 –The JavaScript **12 hrs**

Overview of JavaScript, Execution Environment, Object orientation and JavaScript, Syntactic characteristics, Primitives, operations, and expressions, Arrays, Functions, Pattern matching using regular expressions, Examples. Events and Event Handling, Meaning of client and server, Client-Server architecture, benefits, concept of ports and sockets. Protocol – Meaning, definition, examples, meaning of stateless and state (state full) protocols. HTTP protocol – meaning, http protocol request and response header formats, status codes. Client-Server communication scenario.

PART -B

Unit 3 – JEE Technology Concepts **12 hrs**

Multi-tier architecture for application development – Meaning, need, advantages. Meaning of enterprise application and web application, various tiers in enterprise application – client tier, web tier, business tier, enterprise information system tier. Introduction to JEE concepts – Need, advantages, characteristics of JEE technology, the concepts of containers, components and services – meaning of web container, application client container, EJB container.

Unit 4 – Basics of PHP and Java Server Pages Programming Concepts **12 hrs**

Introduction to JSP - language structure, advantages, characteristics, comparison between Java and Java Server Pages. Various aspects of Java Server Pages programs, writing and executing JSP programs. Writing dynamic programs using JSP. Database programming through JSP. Basics of PHP : Introduction ,variables ,functions, sessions, date, my sql integrations with php, file uploading.

References:

1. The Complete Reference – J2EE – Jim Keogh
2. J2EE – Kevin Mukhar, James L. Weaver, James P Crume, RonPhillips
3. learningphp and mysql4thEdition Robin Nixon.
4. Begining php-5 and Mysql Cristian Darie.

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BCA 5.3 OPERATING SYSTEM

PART- A

Unit 1–Introduction **12 hrs**

Definition of Operating System, need. Early systems – Batch Systems, Multiprogramming, Time Sharing, Parallel and Distributed systems. Special Purpose Systems – Real Time, Embedded Systems, Multimedia Systems, Handheld Systems. Computing Environments – Traditional, Client Server, Peer-to-Peer and Web based. Open Source Operating Systems.

Unit 2 –Process Management **14 hrs**

Process concept – meaning of process, sequential and concurrent processes, process state, process control block, threads, Process scheduling – scheduling queues, schedulers, context switch. Operations on Processes – creation and termination. Inter process communication – Independent and co-operating processes. Communication in client-server systems – RPC and RMI. Process scheduling – Basic concepts Processor - CPU I/O burst cycle, CPU Scheduler, Preemptive scheduling, dispatcher. Scheduling criteria, Scheduling algorithm – First-Come-First-Served (FCFS), Shortest Job First (SJF), Priority Scheduling, Round Robin. Multi-level queue scheduling (Concepts only), multi- level feedback queue scheduling (Concepts only). Multiple processor scheduling, real time scheduling.

PART -B

Unit 3–Deadlocks **08 hrs**

Definition with example, System model, Dead lock characterization – Necessary Conditions, Resource Allocation Graph, Dead lock prevention, Avoidance and detection, Recovery from deadlock.

Unit 4 –Memory Management, Disk and File Management **14 hrs**

Logical and Physical address space, Swapping, Contiguous allocation, Paging, Segmentation, Virtual memory - demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrashing. Secondary Storage Structure and Disk Management: Disk structure & scheduling methods, Disk management, disk reliability. File concepts, Access methods, Directory structure, Protection and consistency semantics, File system structure, Allocation methods, free space management.

References:

1. Abraham Silberschatz and Peter Baer Galvin, Operating System Concepts, Fifth edition, Addison - wesley 1989.
2. Milan Milonkovic, Operating System Concepts & Design, II Edition, McGRaw Hill 1992.
3. Stallings, Operating Systems, PearsonEdition.
4. Tanenbaum, Operating System Concepts, PearsonEducation
5. Nutt : Operating System, 3/e Pearson Education2004

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BCA5.4 DATACOMMUNICATION

PART- A

Unit 1 - Introduction to Data Communication 14 hrs

Communication model & Data Communication networking –types. Data Transmission- Transmission terminology, Analog & Digital data transmission, Transmission impairments – attenuation, delay distortion & noise. Guided Transmission- types- Twisted pair, coaxial cable & optical fiber – physical description, application & characteristics. Unguided Transmission- wireless transmission: types- Terrestrial type, Satellite, Broadcast radio – physical description, application & characteristics.

Unit 2-Dataencoding 10 hrs

Basics, types and description of different signals, Digital data & digital signals: NRZ, multilevel binary, Bi phase techniques. Digital data & Analog signals: Encoding techniques- ASK, FSK, PSK Analog data & Digital signals: PCM & delta modulation Analog data & Analog signals: Modulation- AM & FM Spread spectrum: Frequency hoping, direct sequence Asynchronous & synchronous transmission: Line configurations- full duplex & half duplex.

PART- B

Unit 3- Data link control & medium access sub 12 hrs

Flow control: Stop and wait & sliding window flow control. Error detection: Parity check, CRC Error control: Stop and wait ARQ, Go Back-N ARQ High-level data link control: basics, Characteristics, frame structure, operation Medium access sub layer- the channel allocation problem. Multiple access Protocol- ALOHA, carriers sense multiple access protocol, collision free protocol.

Unit 4- Multiplexing and Switching 12 hrs

Frequency division multiplexing- characteristics, analog carrier systems, Time division multiplexing- characteristics, link control. Digital carrier system, ISDN user network interface. Circuit switching networks- switching concept, space division & time division switching- Pocket switching networks-principles, switching technique, and packet size. Comparison of Circuit switching & Pocket switching

References:

2. Data and Computer Communications – William Stallings.
3. Computer Networks – Andrew S.Tanen baum.
4. Data Communication – Ulysis D Black.
5. Data Communication and Networking – Behrouz A. Forouzan.
6. Internetworking with TCP/ IP – Douglas E comer, PHI

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BCA 5.5 COMPUTER NETWORKS

PART -A

Unit 1-Basics **14 hrs**

Uses of computer networks, network hardware- broadcast networks, point – to -point networks, network software-protocol hierarchies, design issues, interface & services, connection oriented & connection less services, service primitives, OSI reference model- description of each layer. TCP/IP reference model, comparison of the two models, Critique of the OSI model and protocols, Critique of the TCP/IP model and protocols, Example networks-ARPANET,ATM.

Unit 2- The Network layer **12 hrs**

Design issues, routing algorithms- the optimality principle, shortest path routing, distance vector routing, and link state routing. Congestion control algorithms- general principle, Congestion prevention policies, traffic shaping. The network layer in the internet - the IP protocol, IP address, and subnet. Internet control protocol.

PART -B

Unit 3- The Transport layer **12hrs**

The transport service- services provided to the upper layer, quality service, and transport service primitives. Elements of transport protocol - addressing, establishing a connection, releasing a connection. A simple transport protocol- the example service primitives, the example transport entity. The Internet transport protocol (TCP & UDP)- the service model, the TCP segment header, the TCP connection management. UDP - header.

Unit 4- The Application layer **10hrs**

Network security - traditional cryptography, two fundamental cryptographic principles, secret key & public key algorithms.DNS - Name space, SNMP - model.Electronic mail, architecture and services, www.

References:

1. Data and Computer Communications – WilliamStallings.
2. Computer Networks – Andrew S.Tanenbaum.
3. Data Communication – Ulysis DBlack.
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BCA - 6.1 UNIX OPERATINGSYSTEM

PART- A

Unit 1-Introduction **12 hrs**

The Unix operating system, , A brief Session, The Unix Architecture, Features of UNIX, POSIX and Single UNIX specification, Locating commands, Internal and External commands, Command Structure, Flexibility of command Usage, Man Browsing the Manual Pages ON-line, Understanding the man Documentation. General-Purpose Utilities: Cal command, date command, echo, printf, bc, script, passed, who, uname.

Unit 2 – The File System **10 hrs**

The file, The Parent –Child Relationship, The HOME Variable, pwd, cd, mkdir, rmdir, Absolute Pathname, Relative Pathname, ls, The Unix File system. Handling Ordinary Files: Cat, cp, rm, mv, more, The lp subsystem: Printing a File, File, wc, od, cmp, comm, diff, dos2unix and unix2dos, compressing and archiving files, gzip, and gunzip, tar, zip and unzip. Basic File Attributes: Listing file attributes, listing directory attributes, File Ownership, File Permissions, changing file permissions, Directory Permissions, Changing File Ownership.

PART- B

Unit 3 – The Vi Editor **14 hrs**

Vi basics, Input Mode, Saving Text and Quitting, Navigation, Editing Text, Undoing Last EditingInstructions(UandU),Repeatingthelastcommand(.),SearchingforaPattern(/and ?), Substitution. Process basics, process status, system process, Mechanism of process creations, Internal and external commands, process states and zombies, running jobs in background, nice, killing process with signals, job control, at and batch, cron, timing process. Simple Filters: The sample database, pr, head, tail,cut, paste, sort, uniq, tr, displaying a word- count list. Filters using regular expressions: grep, basic regular expressions, extended regular expressions.

Unit 4 –The Shell **12 hrs**

The shell's Interpretive Cycle, Shell Offering, Pattern Matching, Escaping and Quoting, Redirection, /dev/null and /dev/tty, Pipes, tee, Command Substitution, Shell variables. Essential shell programming: Shell scripts, read, using command line arguments, exit and exit status of command, the logical operators &&and ||- conditional execution, the if conditional, using test and to evaluate expressions, the case conditional, expr, $0: calling a script by different names, while, for, set and shift, the here document (<<), trap, debugging shell scripts with set –x, sample validation and data entryscripts.

References :

1. Sumitabha Das, UNIX System V.4, Concepts and Applications, TMH

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BCA - 6.2 .NET PROGRAMMING

PART -A

Unit 1 - Introduction to C# & .NET platform and Building C# Applications 10 hrs

Introduction to C# and .NET platform : .NET solution, Building blocks of the .NET platform(CLR, CTS, CLS), Role of .NET base class libraries, .NET Aware programming languages, role of common intermediate languages & type metadata and assembly manifests, A tour of the .NET namespaces. Building C# Applications : Role of the command line complier(csc.exe), Building a C# application using csc.exe, the command line debugger(cordbg.exe), using the visual studio.NET IDE & its debugging, C# pre-processor directives.

Unit 2 - C# language fundamentals 14 hrs

Anatomy of a basic C# class, creating objects: constructor basics, Default assignments & variables scope, variables initialization syntax, basic inputs & output with the console class, understand static methods, arrays & string manipulations, Encapsulation Services, Class Properties , Read and Write only Properties, Static Properties, Inheritance Is As keyword Usage, Controlling Base Class Creation With Base, Sealed Classes, Delegation , Polymorphism, The Virtual and Override Keywords ,Abstract Classes, Abstract Methods

PART- B

Unit 3 - Exception & object life time and Interface and Collections 12 hrs

Exception & object life time :The Basics of Object Life Time, The Role Of Application Roots, Understanding Object Generations, The Role Of .NET Exception Handling, Throwing a Generic Exception ,Catching Exceptions, Properties of Exception, Multiple Exception (Concepts Only),The Finally Block. Interface & Collections : Definition, Implementing an Interface in C#, Interface members at object level, Interface as Parameters, Interface as Return Values, Arrays of Interface Types, Interface Hierarchies, Interface as polymorphic agents, Exploring the system. Collections Namespaces.

Unit 4 – Introducing windows forms 12 hrs

Overview of the system. windows. Forms Namespaces, An Anatomy of a Form, A Simple Form Program, Function with Control Class, The Functionality Of the Form Class, Component class, control class, Programming with windows forms controls : Working with Button types, Check Boxes, Radio Buttons, Group Boxes, List Boxes, Calender control, assigning tool tips for controls.
The Two Faces Of ADO. NET, Understanding ADO.NET Data Providers, Understanding The Connected Layer of ADO.NET, Working with Connection Object, Inserting, Updating and Deleting Records

References:

1 Pro C# with .NET 3.0 Andrew Troelsen
2 2 C# Programming E Balaguruswamy

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BCA - 6.3.1 ELECTIVE-I DIGITAL IMAGE PROCESSING

PART- A

Unit 1- Digital Image **12 hrs**

Introduction: Motivation and Perspective, Scenes and Images, Application: Components of Image Processing System. Visual Preliminaries: Brightness Adaptation and Contrast- Acuity and Contour, Texture and Pattern Discrimination, Shape Detection and Recognition- Perception of Color. Image Formation: Geometric Model, Basic Transformations, Perspective Projection, Camera Calibration- Photometric Model. Digitization:Sampling, Quantization, Visual Detail inthe Digital Image, Digital Image, Elements of Digital Geometry.

UNIT-2: Image Processing **12 hrs**

ImageEnhancement: Contrast Intensification, Smoothing, Image Averaging, Mean Filter, Ordered Statistic Filter, Edge Preserving Smoothing Low Pass Filtering. Image Sharpening, High, PassFiltering, Homomorphic Filtering. Restoration: Minimum Mean, Square Error Restoration, Least Square Error Restoration ,Constrained, LeastSquare Error Restoration, Restoration by Singular Value Decomposition-Restoration by Maximum A Posterior Estimation, Restoration by Homomorphic Filtering.

PART- B

UNIT-3 :Image Compression **12 hrs**

Error Criterion: Lossy Compression methods, loss –less compression, Huffman coding, Run length coding- Block coding, Quad Tree coding- contour coding. Registration: Geometric Transformation, Plane toPlane Transformation, Mapping Problem in Discrete Domain –Stereo Imaging Algorithms.

Multi-Valued Image Processing: Processing of color Images, Processing of Satellite Image, and Medical Image Processing. Segmentation: Region Extraction-Pixel based Approach, Feature Thresholding, Optimum Threshold, Threshold Selection Methods, Multi-level Thresholding, Local Thresholding, Region based Approached.

UNIT-4: Image Analysis and Feature Extraction **12 hrs**

Edge and Line Detection: Edge Detection, Derivation operators, Pattern Filling Approach, Morphologic Edge Detection, Edge Linking and Edge Following, Edge elements Extraction by Thresholding, Edge Detector Performance, Line Detection, Corner Detection. Representation: Topological Attributes, Geometrical Attributes, Some other Properties, Description, - Boundary based Description-Region based Description-Relationship. Recognition: Deterministic Methods, Clustering, Statistical Classification,Fuzzy Mathematical Recognition,Syntactic Recognition, Grammar, Recognition Strategy, Tree search, Graph Matching.

References:

1) B. Chand and D. DuttaMajumder ,Digital Image Processing and analysis, PHI(2001)
2) Milan Sonka, "Image Processing Analysis and Machine Vision", PWS Pub.2nd Ed.
3) Adrian Low, Computer vision and Image Processing, McGraw Hill (1991)
4) Kenneth R. Castle man, Digital Image Processing ,PHI

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BCA - 6.3.2 ELECTIVE-I CLOUD COMPUTING

PART- A

Unit1 - Cloud Computing Basics **12 hrs**

Cloud Computing Overview- Applications – Intranets and the cloud – Why Cloud Computing Matters – Benefits – Limitations – Companies in the Cloud Today – Cloud Services.

Unit 2 - Cloud Computing Technology **12 hrs**

Hardware and Infrastructure – Clients – Security- Network – Services – Accessing the Cloud - platforms – Web Applications – Web APIs –Web Browsers –Cloud Storage – Overview – Cloud Storage Providers –Standards –Application – Client – Infrastructure – Service.

PART -B

Unit 3 - Cloud Computing At Work **12 hrs**

Software as a service – Overview – Driving Forces – Company offerings – Industries– Software plus Services – Overview - Mobile Device Integration –Providers – Microsoft Online.

Unit 4 - Developing Applications **12 hrs**

Google – Microsoft – Intuit Quick Base – Cast Iron Cloud – Bungee Connect - Local clouds and Thin Clients – Virtualization – Server Solutions – Thin Clients. Cloud Services for Individuals – Cloud services aimed at the mid-market –Enterprise-Class Cloud Offerings – Migration.

References:

1. Velte T. Antony, Velte J. Toby. andElsen Peter Robert (2010), “Cloud Computing: A Practical Approach”, Tata McGraw- Hill
2. Miller Michael (2008), “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing.
3. Beard Haley (2008), “Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs”, EmereoPvt. Limited.

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BCA- 6.4.1 ELECTIVE-II COMPUTERGRAPHICS

PART -A

Unit 1 - IntroductiontoMultimedia **12 hrs**

Definition, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia skills .Multimedia building blocks- SOUND: MIDI, Digital audio, audio file formats. Images: still images, color and file formats. ANIMATION: principles of animation, making animation. VIDEO: using video, how video works, and videostandards.

Unit 2 - Introduction toGraphics applications **12 hrs**

CAD , presentation graphics, computer art, entertainment, education and training, visualization, image processing. Display devices – raster scan displays – color CRT, DVST, LCD, 3D viewing devices. Raster scan systems, Random scan systems.

PART-B

Unit 3 -Outputprimitives **12 hrs**

Points and lines, line drawing algorithm, DDA algorithm, Bresenham's line algorithm, examples, parallel line algorithm, loading the frame buffer, circle generating algorithm, midpoint circle algorithm, and ellipse generating algorithm. Pixel addressing and object geometry. Color and gray scale levels, color tables, character attributes. Basic Transformations- translation,scaling, rotation, matrix representation and homogeneous coordinates, composite transformations, general pivot point and fixed point rotation, scaling directions, other transformations – reflection, shear, transformation between coordinates, inverse transformations.

Unit 4- WindowingandClipping **12 hrs**

Introduction, the viewing transformation, viewing transformation implementation, clipping, Cohen-Sutherland outcode algorithm, Liang-Barsky line clipping algorithm, Sutherland- Hodgeman polygon algorithmand adding clipping to the system, text clipping, exterior clipping, curve clipping.

References:

1. Tay Vaughan "Multimedia – making it work", TMH publication, fifthedition.
2. D Hearn & M P Baker: "Computer Graphics C version", PearsonEducation
3. D Newman and Sproull: "Principles of Interactive Computer Graphics -, TMH,IIedition.
4. Steven Harrington "Computer graphics: A programming Approach", TMH publication. Secondedition
5. Roy plastock and Zhigang Xiang: " Computer graphics". Schaum's outline series, II edition.

GENERAL INSTRUCTIONS FOR PAPER SETTING

In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.

1. In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.
2. There shall be 08 questions (4 questions from each part).
3. Each question must contain sub-questions-(a),(b),…
4. The student has to attend any 05 full questions (16*5).
5. The student has to attend at least one question from each unit.

BCA - 6.4.2 ELECTIVE-II OPERATIONS RESEARCH

PART-A

Unit1-Operations Research & Linear Programming 14 hrs

Operations research: Nature and meaning, models characteristics, advantages, scope. Linear Programming Problems: Formulation (both minimization and maximization type) solution of LPP using graphical method. General LPP. Basic solutions and degenerate solutions.Standard form and canonical form. Characteristic features of LPP. Simplex method for solving LPP.

Unit 2 - Transportation Problem 12 Hrs

Big-M method and 2 phase method for solving LPP. Transportation Problem - Formulation, Necessary and sufficient condition for the existence of feasible solution to a Transportation problem. Initial Basic Feasible Solution by North West Corner Rule, Least Cost Method and Vogel's Approximation Method. Optimal solution using U-V method.

PART-B

Unit 3 – Assignment Problem and Game Theory 14 Hrs

Assignment Problem.:Formulation, optimal solution using Hungarian algorithm, traveling salesman problem. Game Theory:Basic definitions, minmax - maxmin principle and optimal strategy solution of games with saddle point, dominance rule for solving a two-person Game, Graphical method for solving two-person game.

Unit 4 -Network analysis 10 Hrs

Basic differences between PERT and CPM, PERT, CPM, Network components and precedence relations, rules of network construction, errors and dummies in network, critical path analysis, project time cost trade-off, resource allocation.

References:

1. S. D. Sharma – Operations research
2. Hamdy A. Taha, " Operation Research – An introduction" 5th edition, PHI.,
3. KantiSwarup, P. K. Gupta &Manmohan – "Operation Research", 1996.
4. S. Kalavathy: "Operations Research", Second Edition – Vikas Publications

GENERAL INSTRUCTIONS FOR PAPER SETTING

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1. In each paper unit-1 and unit-2 are Part-A and unit-3 and unit-4 are Part-B.
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4. The student has to attend any 05 full questions (16*5).
5. The student has to attend at least one question from each unit.

I -SEMESTER

Excel & C Lab

PART- A

1. Write DOS commands for the following:
   a. To create a file
   b. To view a created file
   c. To edit the contents of file
   d. To rename an existing file
   e. To delete an existing file
2. Write DOS commands for the following:
   a. To make a directory
   b. To rename a directory
   c. To delete a directory
   d. To change the directory
   e. To display date, time and version

PART -B

Table A

Sales Person	Gender	Number of Sales	Sales Amount	Sold Month and Year
Cara	F	10	8000	12013
Jessy	F	7	6000	12013
Lewis	M	5	4000	32013
Tommy	M	3	2000	42013
Annie	F	2	2000	12013
Jack	M	3	2000	52013
Hugo	M	1	400	52013
Jonathan	M	1	400	72013
Aaaron	M	1	400	12014
Willy	M	4	2800	82013
Patrick	M	3	900	12013
Simmons	M	5	1750	12014
Pattrick	M	6	2250	82013
Taylor	M	2	800	42013
Boon	M	3	1275	42014
Walsh	M	1	450	72013
Julie	F	5	2375	22013

Use only Formula's to Derive the results

Questions	Answers
Sum of sales amount	
Average of sales amount	
Minimum Sales amount	
Maximum number of sales	
Count of Sales Person	
Count of Male Sales person	
Sum of Sales amount of Female Person	
Average of sales amount of Female Person	
Average of Sales amount made in January 2013	
Median of Total Sales amount	
First Quartile to Sales Amount	
Third Quartile to Sales Amount	

Populate the number of sales for below listed Sales Person (Use formula)

Sales Person	Number of Sales
Aaaron	
Pattrick	

1. Consider the above excel sheet and derive the answers using formulae
2. Demonstration of sorting, filters and advanced filters
3. Usage of pivot table.

PART -C

1. Program to find the biggest and the smallest among 4 numbers using nested if.
2. Program to find the roots of quadratic equation.
3. Program to check whether the given number is Armstrong number, odd or even, perfect square or cube.
4. Program to check whether nth prime is palindrome.
5. Program to find the factors of nth Fibonacci number.
6. Program to convert decimal to binary.
7. Program to generate n terms of the series 1,-2,6,-24,120…….
8. Program to find e^x using n terms of the series $1+ x + x^2/2! + x^3/3! +$…..
9. Program to count the number of vowels, consonants and special characters in a string by reading the string character by character.
10. Generate n prime numbers and print them in the following pattern

```
              2                              2
           3   5        OR              3      5     7
       7   11   13                 11    13    17    19     23
   17  19   23  29 …            29     31   37    41    43    47  53…..
```

PRACTICAL EXAM SCHEME

Practical Proper: 60 Marks
Record : 10 Marks
Viva : 10 Marks

DOS (any 5 commands) (10 marks)	**Writing of DOS Commands**	**5 Marks**
	Error free execution of DOS Commands	**5 Marks**
MS Excel (10 marks)	**Any five functions from questions 1 2 and 3 Proper syntax and result (2 marks each)**	**10 marks**
C- Program (40 marks)	**Flowchart/Algorithm**	**5 Marks**
	Program writing	**20 Marks**
	Correct program and Error free compilation	**10 Marks**
	Correct output	**5 Marks**

II -SEMESTER

DATA STRUCTURES & Advanced Excel Lab

PART -A

1. All types of data validation
2. Data visualisation using charts
3. Data visualization using scatter charts, spark lines and gauge charts
4. Usage of hyper links.

PART -B

1. Program to insert an element at given position in an array.
2. Program to multiply two matrices using functions.
3. Program to swap two integers using function with call by value and call by reference mechanism.
4. Program to create a dynamic array of n elements and find their sum and print in reverse order using functions with pointers(sum(int *,int)and rev_print(int *,int))
5. Program to store information of n students (name, regno, dob, m1,m2,m3,tot, avg and result) in an array of structures and find total, average and result using function.
6. Program to find a^b using union to store the values of a, b and a^b (for both int and/or float values of a and b)

PART- C

1. Program to implement the operations of stack using array.
2. Program to implement the operations of circular queue.
3. Program to convert infix expression to prefix notation.
4. Program to evaluate postfix expression.
5. Program to implement any three recursive functions.
6. Program to implement queue using linked list.
7. Program to evaluate an expression using linked list

PRACTICAL EXAM SCHEME

Practical Proper: 60 Marks
Record : 10 Marks
Viva : 10 Marks

MS Excel (10 Marks)	Any one problem from the list	10 Marks
C- Program (25 marks)	Flowchart/Algorithm	5 Marks
	Program writing	10 Marks
	Correct program and Error free compilation	5 Marks
	Correct output	5 Marks
Linear Data Structure (25 marks)	Algorithm	5 Marks
	Program writing	10 Marks
	Correct program and Error free compilation	5 Marks
	Correct output	5 Marks

III- -SEMESTER DS Lab Using C++

PART- A

1. Consider a class student with data members name, regno, course, m1, m2, m3 and member functions getdata(), showdata(), result() to read, print and tabulate result. Write C++ program to store the details of n students and display their result in tabulated form.
2. Write a C++ program to define a class BankAccount including the following class members and store information of n customers and display their details. DataMembers:, cust name, accno, balance.
   Member Functions: a) getdata(custname,accno,balance). b) display(). c).Transaction(tr_type,amt) if Tr_type='D' transaction is deposit else transaction is withdrawal. This function should update the balance according to tr_type after checking the minimum balance of Rs 1000.
3. Write C++ program to demonstrate operator overloading
4. Program to demonstrate the use of simple, parameterised and copy constructors
5. Program to demonstrate inline and friend function.
6. Program to demonstrate function overloading.
7. Program to demonstrate multiple or multilevel inheritance

PART- B

1. Program to demonstrate the operations of doubly linked list
2. Program to demonstrate tree traversal
3. Program to implement tree sort.
4. Program to implement quick sort
5. Program to implement heap sort.
6. Program to implement radix sort.
7. Program to demonstrate time and space complexity in binary and linear searching
8. Program to compare shell and insertion sort methods.

PRACTICAL EXAM SCHEME

Practical Proper: 60 Marks
Record : 10 Marks
Viva : 10 Marks

C++- Program (25 marks)	Program writing	15 Marks
	Correct program and Error free compilation	5 Marks
	Correct output	5 Marks
Linear Data Structure (35 marks)	Flowchart/Algorithm	10 Marks
	Program writing	15 Marks
	Correct program and Error free compilation	5 Marks
	Correct output	5 Marks

III-SEMESTER
SQL LAB

I. Create emp and dept tables as below and write SQL statements for the following queries

Emp(ename not null, eno primary key, doj date,dob ,mgrno self reference key, salary >0 , comm, deptno foreign key)

Dept(dname not null, dno primary key, location)

1. Find the employee details in ascending order of their name and descending order of their salary
2. Find the details of all employees in the research department
3. Find the minimum, maximum and average salary of each department
4. Find department name having least number of employees
5. Find the department name having highest annual payroll
6. Add an employee under the manager smith
7. Find the employees who are not getting commission
8. Display the eno, name manager name and department name in the order of their department

II. Create tables as below Student(name string, regno string primary key, dob date, doj date ,course string foreign key) Markscard(regno foreign key, sem string, sub1 number, sub2 number, sub3 number, tot number, avge number, result string)

Calculate total, average and result using update statement

Write SQL statements for the following queries.

1. List the names of students studying in BCA course in the order of their joining
2. Find the name of student who has scored highest marks in every sem of each course
3. Count the number of students in each course (consider only distinct students of the course)
4. Find the course having second highest number of students
5. Raise the marks of sub3 in III sem BCA students by 5% if the student has failed in that subject
6. Display the details of student 'xxx' in every semester.

III. Dept(deptno integer pkey, dname string not null, loc string not null)

Emp(eno integer pkey, ename string, deptno fkey, desgn string not null, bsal number>0)

Salary(eno fkey,da,hra,gross,it,pf,net,comm) DESGN ARE manager,clerk,salesman. Comm=5% of basic if desgn=salesman otherwise null. Da=15% bsal hra = 7% of bsal gross=bsal+da+hra.

IT =0 if gross<15000

= 10% of gross if gross between 15000 and 30000

=20% of gross if gross between 30000 and 50000

= 30% of gross otherwise

PF =10% of gross or 1000 whichever is less. Calculate salary using update statement

Write sql statements for

1. Count the number of employees in every designation
2. List the employees of every department in descending order of their net salary
3. List the name and salary of highest salary payer in every department
4. List the name of employee paying highest IT in each department
5. List the departments in every location
6. Raise the basic salary by 10% for the managers of every department.

IV. Create tables as below

Employee(eno primary key, ename, street, city)
Company(cno primary key, cname, city)
Works(eno foreign key, cno foreign key, sal>0)
Manages(mno foreign key from employee table , eno foreign key from employee table)

Write sql statements for the following queries

1. Find the name of all employee working in the city in which they live
2. Find the company having most employee
3. Count the number of employees under each manager.
4. Find the company having second highest payroll
5. Find employee drawing more salary than his manager in every company
6. Raise the salary of every manager by 25%
7. Find name of employees who are not having managers
8. Find average, highest and lowest salary of every company
9. Delete the employees and the information of company 'xxx'

PRACTICAL EXAM SCHEME

Practical Proper: 60 Marks
Record : 10 Marks
Viva : 10 Marks

Table creation	10 Marks
Inserting proper data	08 Marks
Table updation (if necesssary)	12 Marks
5 / 7 writing	15 / 21 Marks
Execution	15 / 21 Marks

IV -SEMESTER
PLSQL BASIC PROGRAMS

PART - A

1. Create a library table with attributes book id, author_name, publisher, price and edition. Write PL/SQL code block to accept the publisher name and count number of books under that publisher and display it. Also display the publisher with maximum publication.
2. Write a function to display employee name with distinct salaries
   For eg
   if a 's salary is 100
   b 's salary is 200
   c 's salary is 100
   display either (a or c) and b
3. Write a function to rank the employees based on their salary (use RANK function)
4. Write a function to validate the Employee email id.
5. Write a procedure to capture the error log in a table in case of an exception using Autonomous_transaction,
6. From employee table, store ename and salary in varrays and display the contents of the arrays in table format.
7. Write an Anonymous block which raise a user defined exception on thursday?
8. Write an anonymous block using associative array that is indexed by a string, populates it, and prints it.

PART -B

1. Write a pl/sql code block to create a table and menu driven code to add, modify and drop specified column in it.
2. Write a pl/sql code block to create a database and menu driven code to add, rename and drop specified table into it.
3. Write a PL/SQL cursor program which is used to calculate total salary from emp table without using sum() function?
4. Create a trigger to record the changes like insert, update, delete over the employee table (The changes should be recorded in new audit table Employee_au)
5. Write a function to remove the duplicates in the employee table and copy all the records into another new table.
6. Write a function using bulk collect , to process set of 100 records in one iteration
7. Write a statement trigger on emp table such that the insertion is possible only on Thursday.
8. Write a function using dynamic sql statements , where the column names and the table name should be provided as input to the function.
9. Write an anonymous block to create nested tables and compare the values in nested tables
10. Write an anonymous block using multilevel VARRAY
11. Write an anonymous block to check if a collection element exists or not ?
12. Write a function using NEXT and PRIOR to access the elements in a collection TABLE

PRACTICAL EXAM SCHEME

Practical Proper: 60 Marks
Record : 10 Marks
Viva : 10 Marks

Part A (20 marks)	Program writing	10 Marks
	Error free compilation	05 Marks
	Correct output	05 Marks
Part B (40 marks)	Program writing	20 Marks
	Error free compilation	10 Marks
	Correct output	10 Marks

IV -SEMESTER
Java Lab

PART- A

1. Write a Java program to display only those multi-digit prime numbers between a given range whose digit sum is prime. Display the prime number and its digit sum side by side. Read the value for the range using *readLine()* method of *BufferedReader* class.

   Sample output:
   If range is; m = 20, n=50

Prime number		Sum of digits
23	-	5
29	-	11
41	-	5
43	-	7
47	-	11

2. Write a Java program to sort the elements of a square matrix. Read the order and elements of the matrix during execution. Before sorting the elements of the matrix, display the source matrix.

   Sample output:
   Input Matrix is:

   20 2 35
   4 16 7
   41 3 2

   Matrix elements after sorting:

   2 2 3
   4 7 16
   20 35 41

3. Write a java code to create a class with data members name, category, doj, and fees and static members total_fee, categorywise_no_students, methods to Insert data using parameterized constructor, display student information along with total fees and number of students in each category.
4. Write java program to demonstrate method overloading to generate random numbers, random alphabet sequence and random strings.
5. Assume that an examination authority conducts qualifying examination for candidates twice eachyear. First, in the month of June, second, in the month of December. Before the exam, it opens a registration process so that candidates register themselves. After the end of the registration dates, the authority consolidates the list of candidates and generates the unique register numbers. These numbers are assigned to each candidate. The format of the register numbers is as below. Each register number should contain exactly 10 characters.

	year of Registration	cle	rial Number

For example, if year of registration 2018, cycle 2 and there are five candidates registered then, registration numbers are: QE20182001, QE20182002, QE20182003, QE20182004, QE20182005.

The serial numbers should contain exactly 3 digits. To maintain it, prefix zeros as needed. (up to 9 serial number should be prefixed with two zeros, after 9, upto 99 it should be prefixed with single zero and after 99, no zeros). Write a Java program to generate the registration numbers as per the above requirement.

6. Write a Java program to read name, register number, date of birth, address, phone number a student. Concatenate these to frame a single content by delimiting each detail with a special symbol, pass it to a method which should separate and display the details of the student. Declare a class containing the following methods:

   void getInformation() – to read student information. It should call concatenate(,,,,) by passing relevant information.

   void concatenate(String name, string regNo, String dob, String address, String phoneNo) to join the information to frame a single content. It should call

extractInformation(…) by passing the concatenated information.

void extractInformation(String joinedInfo) to extracted concatenated contents and to display the information.

Declare another class to contain main () method which calls *void getInformation().*

Sample output:
Student Name: Venkata Krishna
Register Number: BC171128
Date of Birth: 10/05/1996
Address: No. 5, First Cross, Nehru Nagar, Sagar.
Phone Number: 9900990099
Concatenated content:
Venkata Krishna%BC171128%10/05/1996%No. 5, First Cross, Nehru Nagar, Sagar.%9900990099
(Application: This is the way using which collection of information is communicated between client and server in networked environment)

7. Consider class person with fields name, address and date of birth and methods read_data() and show() and another class employee inherited form person class with fields emp_id, date of join and salary and methods read() and show(). Write java program to implement the concept of single inheritance with method overriding concepts for the above classes.

PART B

1. Write a Java program to create a vector, add elements at the end, at specified location onto the vector and display the elements. Write an option driven program using switch…case and also insertion of any type of objects must be possible. Read input as strings and find the type of data and convert them into appropriate objects of appropriate classes. (Ex: 10 must be converted to object of Integer class, 2.5 into object of Float class etc.). Handle exception while converting the inputs.
2. Declare an interface containing methods *float addition(float x, float y)* and *float subtraction(float x, float y)*. Declare the classes implementing the interface to perform respective operations as listed below.

Bank - to carryout deposit and withdrawal operations. In addition to the implementation for the abstract methods, the class should contain additional methods to read and display customer information to perform the respective transaction.

EmployeeSalary - to calculate the gross and net salary. In addition to the implementation for the abstract methods, the class should contain additional methods to read and display employee information, allowance amount and deduction amount to perform the respective transaction.

Main class - which instantiates above two classes and calls respective methods.

3. Write java program to demonstrate multi level inheritance using appropriate real life example.
4. Write a java program to create a package Number which contains a class with three static methods prime, fibanocii and Armstrong that checks whether the passed value is belongs to the corresponding types.
5. Write a java program to demonstrate multithreading using runnable interface.
6. Write an applet to display the address of a person (atleast 4 lines) using parameter passing concept. Appropriate message should be displayed for wrong input.
7. Write an applet to draw a polygon based the number of sides of the polygon as input. Ex. If sides =3 it should draw a triangle, for 4 square for 8 octagon etc.
8. Write an applet to draw n squares, rectangle and circles.

PRACTICAL EXAM SCHEME

Practical Proper: 60 Marks
Record : 10 Marks
Viva : 10 Marks

Part-A (25 marks)	**Program writing**	**15 Marks**
	Correct program and Error free compilation	**5 Marks**
	Correct output	**5 Marks**
Part-B (35 marks)	**Program writing**	**20 Marks**
	Correct program and Error free compilation	**10 Marks**
	Correct output	**5 Marks**

V - SEMESTER ADVANCED JAVA LAB

Part A

1. Create a Frame inside an applet and rotate a shape inside the frame using java2D (Graphics2D class)
2. Write a java program to display the directory contents(subdirectories and files) in a tree format using JTree class of swing.
3. Write a java program to display BCA 5th sem timetable using JTable class of swing.
4. Write a program to implement keyboard events (when both printable and character keys are pressed)
5. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired and trace the mouse pointer path only for dragging.
6. Write a program to check whether a file exists or not.
   a. If exists display the contents of file
   b. If does not exists create the file

Part B

7. Design an UI using swings to display 3/5 objective type questions along with 4 options. If the user presses the submit button then the answers must be evaluated and result must be displayed along with correct answers in different colors.
8. Write a java program to
   a. Design a job application/student admission form using swings
   b. Create the JAR file(when you double click the jar file, application form opens)
9. Write a generic program to sort numerical array and alphabetical array.
10. Write a program using java beans to set and get student information
11. Design an user interface to check the validity of username and password entered by comparing it with the data in the back end.
12. Develop an user interface using swings to demonstrate the operations(insert,delete, edit,display) on employee table(eno,name,dept,salary). Use tabbed panes for each operations.
13. Write a program(preferably UI) to demonstrate the operations(at least 4) on array list/ hash list/set/sorted set.

PRACTICAL EXAM SCHEME

Practical Proper : 60 Marks
Record : 10 Marks
Viva : 10 Marks

Part A (25 marks)	Program writing	15 Marks
	Error free compilation	05 Marks
	Correct output	05 Marks
Part B (35 marks)	Program writing	20 Marks
	Error free compilation	10 Marks
	Correct output	5 Marks

V-SEMESTER WEB PROGRAMMING LAB

Part A

1. Create a webpage using html to display college information with appropriate images and list of departments table of scholarships available.
2. Create a webpage using html to display the below mentioned table (use appropriate colors):

Name		Place
Rama	R	Bhadravathi
Kumar	K	Shimoga
Rajesh	S	Thirthahalli
Ramakrishna	RK	Bhadravathi

3. Create a webpage to display system date in the given format: Ex: 01 January 2016.
4. Create a webpage to demonstrate the use of external Cascading Style Sheets.
5. Create a webpage with two textboxes and command buttons to perform arithmetic operations and display the result in appropriate dialog boxes using JavaScript.
6. Create a webpage to convert a given text from uppercase to lowercase using JavaScript.

Part B

7. Your college wants to keep a record of student placements. Design a user interface to accept Student name, Register number, Course, Combination, Placement Mode (On campus, off campus), Name of the company (or office), Employer Type (Private, Government), Selection date, Package. The accepted data should be recorded in the database table (the choice of database management system is open except MS-Access). Write a JSP program for the purpose. Verify every omission and errors in feeding the data.
8. With the help of your lecturer, prepare a questionnaire with five multiple choice questions related to the seminar feedback, from the delegates, which was organized in your college by your department. The form should accept the name of the delegate, Delegate Type (Student or Staff), designation (for students, designation should be student) department (for students, department should be the course in which he/she is studying in), Address and Phone number. When the feedback is given through this form, the details of the delegate along with the feedback should be stored in a database table (the choice of database management system is open except MS-Access).
9. Assume that your college is organizing one day workshop on J2EE technology. The head of the BCA department has asked you to design a registration form for the purpose. On the day of the workshop everyone, staff and student, need to register themselves. For registration, Name of the delegate, Name of the college, Student or Staff, Address, Phone Number are required. Design a user interface to collect these. Provide two buttons **SAVE** and **DISPLAY**. Validate each user interface control for all possible omissions and errors. If the provided details are correct and the button clicked is **SAVE**, store details in a text file. While storing, place any special symbol to join different details related to the delegate. If the clicked button is **DISPLAY**, display the list of delegates which are stored already in the text file by using TABLE tag. Write a program using JSP for the above described requirement. Sample content of the text file is given below. The first line should be the header, describing each detail related to the delegate.

   Sl. No.#Delegate Name#College Name#Student/Staff#Address#Phone Number#
   1#Aravind#GFGC #Staff#bAPUJI NAGAR SHIMOGA#7338464000#
   2#Ashwini K. R.#Govt. First Grade College#Student#Soraba#6364657687#

10. Assume that you are developing an application in order to provide online services to the users. To get the service, first, users have to register themselves. Design a user interface to read email id, name and date of birth; two buttons, **PROCEED** and **CLEAR**. When **PROCEED** is clicked, email id, name and date of birth entered should be verified and the user should be 18 years old to get registered. After successful verification, the next page should display the data

entered in the previous page along with a button **GET OTP** to get the OTP, a text box to type the displayed OTP and a **SUBMIT** button. When **GET OTP** is clicked, the same page should show the generated OTP. The user has to type the displayed OTP in the text box provided. After typing the OTP, when **SUBMIT** button is clicked, the generated OTP and the OTP typed in the textbox should be compared. Upon successful match, the page should show a message indicating the success or a suitable failure message otherwise. Include a JSP fragment file to display the date and time. Date and time should be displayed at the top of the web page. (Hint: OTP can be generated by using four digit random numbers).

11. Twenty students studying in various courses have been shortlisted in a placement program conducted by a reputed company. Your task is to separate the students based on the course and count the students in each course who have been shortlisted.
Input: Register number and name of twenty students.
Output: List of students (Register Number and Name) belonging to each course.
(Hint: One or two characters in register number indicates the course of the student)

12. Assume that an employer is storing the employee salary details, working in his/her firm, in a text file with the format as shown below (# is used as the content delimiter). *EmpId#Employee Name#Designation#Department#Basic Salary#Allowance#Deduction* Write a PHP program to read the employee details from the text file and calculate the Gross and Net Salary of the employees. Display the Gross and Net Salary of each employee along with the other details. (No need to update the text file after calculating the gross and net salary). The program, when executed, should ask the file name containing the employee details. If the file is present, program should extract, calculate and display the salary details. Otherwise, an appropriate error message indicating the failure to locate the file should be displayed on the screen.

13. The Computer Science department is keeping record of fifth semester students' attendance status in a database table (Any database management system can be used like, Oracle, MySQL or any other). The structure of the table is as shown below.

udentAttendance					
egNo	udentName	ubject	assesHeld	assesAttended	tendancePercentage

The last attribute, AttendancePercentage, is a derived attribute. Its value has to be calculated by manipulating ClassHeld and ClassesAttended. Your task is to develop a PHP program, which will access each student's attendance status from the table, calculates the percentage of classes that the student has attended and displays the subjectwise shortage of attendance list. After calculating the percentage, the table needs to be updated with the calculated value.

PRACTICAL EXAM SCHEME

Practical Proper : 60 Marks
Record : 10 Marks
Viva : 10 Marks

Part A (25 marks)	Program writing	15 Marks
	Error free compilation	05 Marks
	Correct output	05 Marks
Part B (35 marks)	Program writing	20 Marks
	Error free compilation	10 Marks
	Correct output	05 Marks

VI-SEMESTER UNIX AND .NET LAB

Part A

1. Write a shell script program to perform all arithmetic operation on floating point.
2. Write a shell script program to check whether the given number is positive or negative.
3. Write a shell script program to reverse a number.
4. Write a shell script program to find sum of digit of a number.
5. Write a shell script program to find the sum of the series (sum= 1 + ½ + ... +1/n)
6. Write a shell script program to add, subtract and multiply the two given number passed as command line argument.
7. Write a shell script to count number of characters in a given string
8. Write a shell script program to read pattern and file name and search whether the given pattern in a file or not.
9. Write a shell script to read filename from command line argument check whether the file is regular file or directory or by both.
10. Find the number of directory file and ordinary files in the current

Part B

Write C# programs for the following requirements:

1. Find the sum of all the elements present in a jagged array of 3 inner arrays.
2. Use the following three techniques to find the area of the triangle.
   a. Using Base and height of the triangle (Formula: ½ x b x h; b = base and h = height).
   b. Using length of the sides of the triangle ($Formula$: $\sqrt{s(s-a)(s-b)(s-c)}$).
   (Where s = $\frac{1}{2}$ $(a+b+c)$; a, b and c are the lengths of the sides of the triangle).
   c. Using the length of one of the sides of the triangle (Equilateral triangle).
   (Formula: S^2 x $\frac{\sqrt{3}}{4}$; S = length of one of its sides)

   Write the overloaded definitions of methods to find the area. Design an option driven program to call these overloaded methods.
3. Assume that 10 candidates have participated in an army selection drive. In the first round of selection, candidates are shortlisted based on their height. Minimum height for the selection is 157.5 cms. Read the height of those 10 candidates in centimetres and list the heights which are equal to or more than the minimum height required for the selection. Also count the number of candidates who have been shortlisted like this. (Program can be written with or without the array).
4. Find the sum of all the elements present in a jagged array of 3 inner arrays.
5. Read 10 register numbers randomly and segregate them based on the course (BA, BSc, BCom, BCA) and semester (first, third or fifth – Analyse the format of the register numbers as assigned by the university).
6. Design an user interface for sign in and sign up task.

PRACTICAL EXAM SCHEME

Practical Proper : 60 Marks

Record : 10 Marks

Viva : 10 Marks

Part A (25 marks)	Program writing	15 Marks
	Error free compilation	05 Marks
	Correct output	05 Marks
Part B (35 marks)	Program writing	20 Marks
	Error free compilation	10 Marks
	Correct output	05 Marks

VI-SEMESTER PROJECT LAB

PROJECT LAB EXAM SCHEME

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories. The project is of 3 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The Project work should be either an individual (one) or a group of not more than five members.

The project proposal should include the following:

- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The examiner will evaluate the project work as follows:

- Project Report - 10 Marks
- Project Demo - 10 Marks
- Viva-Voce - 20 Marks

KUVEMPU UNIVERSITY

Revised syllabus

BCA, B. Sc (Computer Science) and BA (Computer Applications)

W.E.F 2019-20

DEPARTMENT OF P.G. STUDIES AND RESEARCH IN COMPUTER SCIENCE,

JANNASHAYADRI , SHAKARGHATTA

SHIMOGA, KARNATAKA

NEW SYLLABUS FOR B.A (Computer Applications)

(EFFECT FROM 2019-20)

Paper code	Semester	Subject	Weekly hours	Internal marks	External marks	Practicals	Total
BAC-1	I	Computer Fundamentals	4+3	10	50	40	100
BAC-2	II	C-programming	4+3	10	50	40	100
BAC-3	III	Introduction to Data Structure	4+3	10	50	40	100
BAC-4	IV	OOPS with C++	4+3	10	50	40	100
BAC-5.1	V	JAVA	4+3	10	50	40	100
BAC-5.2	VI	DBMS	4+3	10	50	40	100
BAC-6.1	VII	Internet Programming	4+3	10	50	40	100
BAC-6.2	VIII	SE&CN	4+3	10	50	40	100

FIRST SEMESTER BA (Computer Applications)

Computer Applications -I

BAC-1 Computers Fundamentals

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction: **10 hrs**

Definition of computer, Characteristics of computer, history of computers,generations of computer,functional units of a computer, types of computers-based on principle of working, based on size & speed, Definitions of digital computer&analog computer, Definition of super computer,example for super computer.

Unit 2- Hardware: **10 hrs**

Input Device- Keyboard & mouse, OCR, OMR. Output device- monitor and brief description of CRT monitor, Printer and brief description of dot matrix printer, Projector and Headphone (Definition and Uses). Memory-Primary memory: RAM, types of RAM, ROM and its types, Difference between RAM &ROM,Secondary memory: Brief description of working of hard disk and floppy disk,Types of CD-ROM.

Unit 3-Software : **10 hrs**

Definition of software, types of software's – application, system and utility software, Definitions of assembler, compiler, interpreter, linker, loader. Types of Programming Languages -assembly language and machine level language (advantage and disadvantages). Definition of operating System, functions of an operating system, types of operating system, MS DOS Commands with syntax and example (copycon, type, copy, rename, del, make directory, remove directory, dir and its types, copy files from one drive to other drive, tree, hiding files)

Unit 4-Problem solving techniques: **09 hrs**

Algorithm-definition, Characteristics, Notations, Advantages and Disadvantages.Flowchart-Definition, Symbols, Advantages and Disadvantages. Writing an algorithm and flowchart: Area of circle, Arithmetical operations, simple interest and compound interest, Swapping of two numbers, largest of two numbers, factorial of a number, reverse a number, Fibonacci series.

Unit 5-Logic gates: **09 hrs**

Binary number system- Conversion of decimal number into binary number and Conversion from Binary to Decimal number system. ASCII code(brief), Gates – AND, OR, NOT, NAND, NOR, XOR (Definition, Truth Table & Logic Symbol), De-Morgan's Theorem (Statement and Proof).Boolean Laws.

References:

1. Computer fundamentals- P B KOTTUR
2. Computer fundamentals- RAJARAMANNA
3. Digital Logic and Computer Design- M. Morris Mono

QUESTION PAPER PATTERN FOR I SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL :COMPUTER BASICS LAB

1. **DOS COMMANDS:** DATE , TIME, CLS, COPY CON, TYPE, DIR with wild cards, MD, CD, RD, COPY, XCOPY, FORMAT, DISKCOPY etc,.

2. **MS-WORD:**Drafting, Entering, Working with all Menus, Using different fonts and colours the following:
    1. Bio-Data
    2. Application for Job
    3. Joining Report
    4. Creation of Marks Card
3. **MS-EXCEL:**Drafting, Entering, Working with all Menus, Using different fonts and colours the following:
    1. Bio-data
    2. Creation of marks card
    3. Result calculation
4. **POWERPOINT:** Formatting, updating and printing of the following:
    1. Text matter with different fonts
    2. Preparing Charts : Pie Chart
    3. Preparing Graphs: Bar Graph
    4. Introducing Animation
    5. Introducing Sound Effect
    6. Using Hyperlinks

PRACTICAL EXAM SCHEME

- Practical Proper - 30 marks
- ✓ **DOS COMMANDS**–Any two 2X 5marks=10 m
- ✓ arks (writing-2 marks and execution-3marks)
- ✓ **MS-WORD/MS-EXCEL/POWERPOINT**-20marks(writing-10marks and execution-10 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SECOND SEMESTER BA (Computer Applications)

Computer Applications -II

BAC-2 C- Programming

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1-Introduction to C: **10 hrs**

History of C, features of C, basic structure of C, character set, tokens- keywords, identifiers, constants, variables, strings, definition, types, rules for naming, syntax for the declaration, symbolic constant definition.

Unit 2- Operators: **10 hrs**

Increment and Decrement operators, Arithmetic, relational, logical, assignment and bitwise operators, conditional operator and special operators of C, data type conversion, precedence and associativity of operators. Mathematical functions. Formatted and unformatted Input and Output functions – gets(), puts(), getchar(), putchar(), printf() and scanf().

Unit 3-BranchingControl Structures: **09 hrs**

Conditional Control Structures: If Statement, if-else statement, nested if, Switch statement (Explanation with syntax, flowchart and example), goto statement (syntax and example, use).

Unit 4- Looping Control Structures: **09 hrs**

while, do-while and for statements (Explanation with syntax, flowchart and example),Nested for statement. Unconditional control statements - break continue, return and exit(syntax and example).

Unit 5-Arrays and Functions: **10 hrs**

Definition of array, Declaration and initialization, One and two dimensional arrays, string definition, Declaration and Initialization of String variable, String handling functions. Definition of Function, syntax for function declaration and function definition, types of functions, Recursion –definition and example.

References:

1. Computer Concepts and C Programming by P B Kottur.
2. Ansi C, by Balagurusamy E

QUESTION PAPER PATTERN FOR II SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL : C PROGRAMMING

1. Conversion of temperature given in Degree Fahrenheit to temperature in degree Celsius using the formula C = (F-32)/1.8 and vice-versa.
2. Find the biggest amongtwo numbers.
3. Find whether the entered number is odd or even.
4. Arithmetic operations using switch statement.
5. Check whether an entered number is Prime number or not.
6. Find the Fibonacci series between M and N.
7. Searching an element in an array.
8. Addition of two matrices
9. Find the factorial of a number using function.
10. Perform swapping of two numbers using functions

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Flowchart/Algorithm 05 Marks
- ✓ Program Writing 15 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

THIRD SEMESTER BA (Computer Applications)

Computer Applications -III

BAC-3 INTRODUCTION TO DATA STRUCUTRES

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction : **10 hrs**

Definition of Structure, syntax and example for structure declaration.Definition of union, syntax and example for union declaration, difference between structure and union.Pointers–Definition, Declaration, Examples. Dynamic memory allocation functions – syntax and examples. Definition of Data Structure and types of data structures with examples.

Unit 2- Stack and recursion: **10 hrs**

Definition and example of stack (LIFO), operations of stack with algorithms, applications of stack, algorithm for the conversion of infix to postfix expression.Tower of Hanoi problem and Factorial of a number using recursion.

Unit 3- Queue : **10 hrs**

Definition and example of Queue (FIFO), operations on queue, types of queue – ordinary queue and circular queue (definitions only), disadvantages of ordinary queue.Linked list–Definitions and types of lists – Single Linked List, Doubly Linked List (definitions only).

Unit 4-Tree : **09 hrs**

Definition of a Tree, Definition of root, left sub tree, right sub tree, degree of node, terminal node, depth,Definition of Binary tree, types of binary tress (definition only), Algorithm for tree traversal.

Unit 5-Sorting and searching : **09 hrs**

Definition of sorting, explanation of bubble sort, radix sort and merge sort with examples. Definition of searching, explanation of Binary search andLinear search with examples.

References:

1. Systematic approach to data structure –A M Padmareddy
2. Programming in ANSI C - E Balaguruswamy
3. Datastructures and applications - Trembly and Sorenson

QUESTION PAPER PATTERN FOR III SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL :DATA STRUCUTRES LAB USING C

1. Employee program using structure.
2. Implementation of stack
3. Recursive program to simulate Tower of Hanoi concept
4. Recursive program to find factorial of a number
5. Implementation of queue
6. Implementation of linked list
7. Binary tree traversals
8. Bubble sort
9. Binary search
10. Linear Search

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Flowchart/Algorithm 05 Marks
- ✓ Program Writing 15 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

FOURTH SEMESTER B.A (Computer Applications)

Computer Applications -IV

BAC-4 OBJECT ORIENTED PROGRAMMING WITH C++

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to OOP: **10 hrs**

Object Oriented Programming paradigm, Basic concepts of Object Oriented Programming-Classes, Objects, Data Abstraction and Encapsulation, Polymorphism, Inheritance, Dynamic Binding, Message passing, Benefits of OOP, Object Oriented languages, applications of OOP.

Unit 2-Introduction to C++: **10 hrs**

Difference between C and C++, Structure of a C++ program, input and output statements, tokens - Keywords, identifiers, constants, strings and operators, reference variables – definition and example, special operators in C++, brief introduction to control structures in C++.

Unit 3-Classes Objects and Member Functions: **10 hrs**

Difference between structure and class, syntax and example for class declaration, Definition of data member and member function, Defining member function inside and outside the class, inline functions, memory allocation for objects, static data members and static member functions, function overloading, definition of friend function, syntax and example for the declaration of friend function, special characteristics of friend function.

Unit 4-Constructors, destructorsand Operator overloading: **09 hrs**

Definition of a constructor, types - parameterized constructor, default constructor, copy constructor, special characteristics of constructor, definition of a destructor, special characteristics of destructor, definition to Operator overloading, overloading binary operator (+) to add two complex numbers, rules for operator overloading.

Unit 5: Inheritance and templates: **09 hrs**

Inheritance definition, forms of inheritance, syntax and example for defining derived classes, visibility modes, explanation of multilevel inheritance and hybrid inheritance with examples. Definition of templates, syntax and example for class and function template.

Reference Books:

1. Object Oriented Programming with C++ - E Balaguruswamy
2. C++ - The Complete Language – BjarneSchildt
3. Object Oriented Programming in Turbo C++ - Robert Lafore

QUESTION PAPER PATTERN FOR IV SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL :C++ LAB

Write a C++ Program:

1. Which reads a radius of a circle and computes the area of the circle.
2. Which takes an 'n' digits integer number as input and computes the sum of the digits and prints it.
3. To check whether the number is palindrome or not.
4. To find the result of a student using class concept.
5. To Define a class employee having data members name, basic salary, net salary with the member function getdata(), showdata(). Calculate the net salary assuming appropriate % for all allowance and deductions using class concept.
6. To concatenate two strings using library functions.
7. To print Fibonacci series using constructor.
8. To find biggest of two numbers using function overloading.
9. To calculate area of triangle, rectangle and circle using function overloading.
10. To implement Multilevel inheritance by creating classes: Grand Father, Father and Son

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Flowchart/Algorithm 05 Marks
- ✓ Program Writing 15 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

FIFTH SEMESTER B.A (Computer Applications)

Computer Applications -V

BAC-5.1 DATABASE MANAGEMENT SYSTEM

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction DBMS: **10 hrs**

Meaning of data and information, definitions of database, applications of database system, definition of DBMS, disadvantages of file processing system (advantages of DBMS), three levels of data abstraction, difference between schema and instance, definition of data models, types of data models (brief explanation), database languages – DDL and DML.

Unit 2- E-R model : **10 hrs**

Different types of database users, functions of Database Administrator (DBA), basic-concepts - Primary keys, foreign key, super key, definition of E-R diagram, symbols used in E-R Diagram, E-R diagram for Banking enterprise, E-R diagram for Book store, types of entities, entity sets, attributes, types of attributes, weak entity sets, cardinality ratios (mapping cardinality).

Unit 3- Relational model: **10 hrs**

Fundamental operations of Relational algebra - select, project, union, set difference, join, division operations (explanation with examples). Types of aggregate functions – MAX, MIN, SUM, COUNT and AVERAGE (Definition with example).

Unit 4-SQL: **09 hrs**

Definition of Query, explanation of basic structure of SQL – Select, from and where clauses in SQL, data types in SQL, explanation of set operation in SQL – Union, intersection, except, NULL values.

Unit 5- Database: **09 hrs**

design Pitfalls in relational database design, definition of Normalization, Various types of Normal forms (Definitions only) – First Normal form, Second Normal form, Third Normal form, Boyce-Codd Normal Form (BCNF).

Reference Books:

1. Korth, Sudarshan "Database System concepts", Mcgraw Hill-IV Edition.
2. Navathe, Silberchatz and Elmasri "fundamentals of database Systems"-Addison Wesley-2004
3. C.J. Date "Introduction to Database systems" Addison-wesley. 4. Bipin C Desai "Introduction to Data base system" Galgotia publications

QUESTION PAPER PATTERN FOR V SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL :SQL LAB

I. Design an ER-Diagram for representing the BANK scenario.

II. Design an ER-Diagram for representing the College Library Scenario.

III. Use the default EMP and DEPTtables to write SQL statements for the followingqueries

1. Find the employee details in ascending order of their name and descending order of their salary
2. Find names of all employees whose name starts with ‘s’.
3. Find names of all employees who have atleast 6 characters in their name.
4. Find the details of all employees in the research department
5. Find the minimum, maximum and average salary of each department

IV. Create table with the following fields:

TEACHER (teacher-Id, Name, Subject(sub1,sub2,sub3))

Write SQL queries to perform the following:

1. List all the teachers whose teacher-Id lies between 10-20.
2. List all the teachers whose name starts with letter ‘a’.
3. Listall the teachers who are teaching ‘sub2’.
4. List the teacher whose teacher-Id is 12 and teaching ‘sub2’.

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Writing ER-Diagram-10 Marks
- ✓ Table creation & data insertion -10 marks
- ✓ SQL queries- 2 X 5 marks =10 marks[Queries writing 3 marks (each) and Execution 2 marks (each)]
- Viva – voce - 05 Marks
- Record - 05 Marks

FIFTH SEMESTER BA (Computer Applications)

Computer Applications -VI

BAC-5.2 JAVA PROGRAMMING

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction: **10 hrs**

History of Java, Java features, Difference between C/C++ and Java, Java and Internet, Java and WWW, Web browsers, Java support system, Java Development Kit (JDK), Application Programming Interface(API), Java Runtime Environment (JRE).

Unit 2-Overview: **10 hrs**

Structure of Java program, Java tokens, java character set, Java Statements, Implementing Java program, Java Virtual Machine, difference between Applets and applications,

Unit 3- Control Statements and operators in Java: **10 hrs**

Constants, Variables and Data Types in Java, Type casting, Arithmetic operators, relational operators, logical and assignment, conditional, bitwise and special operators, Control Statements: Branching Decision making – if, if-else, nested if, else-if ladder & switch and Looping statements with while, do-while, for statements.

Unit 4- Method overloading: **09 hrs**

Definition of a Class, syntax and example for the declaration and for defining the class, Objects, class members, Constructor, Method overloading, Inheritance: forms of inheritance, Method overriding, Visibility Controls.

Unit 5-Packages : **09 hrs**

Array – 1D array, declaration, creation and initialization of 1D array, Strings – String methods, Vector – Vector methods, , Defining, Extending and Implementing Interfaces, Definition of a Packages, Java API Packages, Creation, accessing and usage of packages.

Reference Books:

1. Programming with Java- A primer, 4th Edition, by E balaguruswamy.
2. The Complete Reference – Patrick Naughton and Schildt
3. Programming in Java – Joseph L Weber

QUESTION PAPER PATTERN FOR I SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL – JAVA PROGRAMMING LAB

1. Write a Java program to convert the given temperature in Fahrenheit to Celsius and display the values in tabular form.
2. Write a Java program to generate first n odd numbers.
3. Write a java program to find area of circle and rectangle using method overloading.
4. Write a Java program to find the circumference of the circle using interface.
5. Write a java program to sort the alphabets in the given string.
6. Write a Java program to create a vector, add elements at the end, at specified location onto the vector and display the elements. Write an option driven program using switch…case.
7. Write a java program to accept student information using array of objects and constructor initialization.
8. Write a java program to perform matrix addition and multiplication using case statement
9. Write a java program to implement constructor overloading by passing different number of parameter of different types.
10. Write a java program to accept studentinformation to perform relevantcomputation using single inheritance.

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Writing 20 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SIXTH SEMESTER BA (Computer Applications)

Computer Applications -VII

BAC-6.1 INTERNET PROGRAMMING

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction: **10 hrs**

Internet basics, basic concepts, communicating on the internet, internet domain, internet server identities, establishing connectivity on internet, client IP address, Overview of TCP/IP and its services, TCP protocols – WWW,FTP, TELNET.

Unit 2-Introduction to HTML: **10hrs**

Information files creation, Web server, web client/browser, HTML tags, structure of HTML program, Text formatting, Text styles, text effects.

Unit 3-Lists: **10hrs**

Definition, types - Unordered and ordered list, adding graphics to HTML Documents. Tables – Definition, table tags and attributes. Definition of Link and its attributes, external and internal document references.Images as Hyperlinks.

Unit 4- Frames: **09 hrs**

Definition, tags, examples. Cascading Style Sheets (CSS) and its Attributes – font, color and background, text, border, list. Span and Divtags.External Style sheets.

Unit 5: Introduction to Javascript: **09 hrs**

Web pafes, Forms, Form validation, Netscape and javascript, Client side javascript, Advantages of javascript, writing javascript into HTML, Basic programming Techniques - Data types and literals, Creating Variables.

References:

1. Web enabled Commercial Application Development using HTML, JAVASCRIPT, DHTML and PHP, by IVAN BAYROSS, 4th Edition, BPB Publication.

QUESTION PAPER PATTERN FOR VI SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL – INTERNET PROGRAMMING LAB

1. Working with web browsers
2. Understanding the working of a web server
3. Home Page Design – Bio Data
4. Home Page Design – College
5. Home Page Design – With Audio Integrated
6. Home Page Design – With Video Integrated
7. Home Page Design – With Audio and Video Integrated
8. Home Page Design – With Animation

PRACTICAL EXAM SCHEME

- Practical Proper - 30 Marks
- ✓ Program Writing 20 Marks
- ✓ Correct output with proper display 10 Marks
  (Partial output – 05 marks)
- Viva – voce - 05 Marks
- Record - 05 Marks

SIXTH SEMESTER B.A (Computer Applications)

Computer Applications -VIII

BAC-6.2 SOFTWARE ENGINEERING & COMPUTER NETWORKS

Theory Examination- 50 Max marks. **Number of Teaching hours –48**

Internal Assessment- 10 Max marks

Unit 1- Introduction to Software Engineering: 10 hrs

IEEE definition of Software and Software Engineering, Software Problems, Software engineering challenges, Software quality attributes, phases in software development (Phased Development process), Definition of Software process, Component software process,desired characteristics of software process, Software development process models- waterfall model.

Unit 2- Software design: 09 hrs

Definition of SRS, need for SRS, Characteristics of SRS, Structure of SRS, design principles, module level concepts – coupling and cohesion.

Unit 3- Coding and testing : 09 hrs

Definition of Coding, Programming principles and guidelines, definition of testing, testing fundamentals, levels of testing, Difference between black box testing and white box testing.

Unit 4-Introduction to Computer networksand Network Hardware: 10 hrs

Definition of computer network, Goals of computer network, Types of Networks based on transmission technology - Broadcast, point- to -point, Types of Networks based on size & scale - LAN, WAN, MAN, Protocol hierarchies (Network software), Network topologies – Bus, Mesh, Ring, tree and star.

Unit 5- Network Software, Reference models and Transmission Media: 10 hrs

Reference models - OSI / ISO model, TCP / IP model, Transmission Media - twisted pair, coaxial cable, fiber optics cable, Internet and its applications, Wireless media - Bluetooth, Wi-Fi.

References:

1. An integrated approach to Software Engineering:PankajJalote.
2. Software Engineering a practitioners approach : Roger Pressman.
3. Computer Networks:5th Edition, Andrew S Tanenbau

QUESTION PAPER PATTERN FOR VI SEMESTER B.A (Computer Applications)

PART -I: 05 Marks

There shall be 05 questions each carrying 01 Marks from all units

PART -II: 10 Marks

There shall be 05 questions each carrying 02 Marks from all units

PART- III: 15 Marks

There shall be 05 questions from 05 units, each question carrying 05 Marks, The student has to attend only 03 questions out of 05 questions.

PART- IV: 20 Marks

There shall be 03 questions and each carrying 10 Marks.
The student has to attend only 02 questions.
(Each question should have at least two sub questions)
Question 1 from Unit 1
Question 2 from Unit 2 & Unit 3.
Question 3 from Unit 4 & Unit 5.

PRACTICAL: PROJECT LAB

PROJECT LAB EXAM SCHEME

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories. The project is of 3 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The Project work should be either an individual (one) or a group of not more than five members.

The project proposal should include the following:

- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The examiner will evaluate the project work as follows:

- Project Report - 10 Marks
- Project Demo - 10 Marks
- Viva-Voce - 20 Marks